

visualising human-centred design relationships: a toolkit for participation

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Abstract

As human-centred philosophies continue to permeate the landscape of design practice, education, and research, a growing body of literature concerning creative methods corresponds with a democratic process that addresses the experiences, needs, problems, and aspirations of users and stakeholders. It can be argued, however, that making tools to gather and evaluate the insights of others contributes to fluctuating perceptions of the designer as a creative auteur, visual communicator, observer, facilitator, analyst, and problem-solver. In turn, human-centred design's overarching neglect of practitioner and researcher reflexivity has resulted in insufficient reasoning and reflection surrounding subjective methodological choices and the impact these have on the direction of the process and the designer's agency.

In this practice-led research, I investigate how human-centred designers collect information and build relationships with participants by making, using, and interpreting visual and participatory tools and techniques. Examining approaches including personas, scenarios, and design probes, I assert that rather than being objective and neutral in seeking participants' input, human-centred designers are inherently reflexive, yet the practical benefits of this researcher trait remain broadly unrecognised and abstract within the discipline. Situating human-centred design in the context of environmental, community, and organisational placemaking, I undertake three case studies to examine localised sociocultural issues. In these, I draw from my position as an illustrator, designer, researcher, PhD student, and participant in the process to provide intimate, immersed, and critical narrative accounts of human-centred design in its initial exploratory stages. Simultaneously, I develop, test, and critique my participatory-reflexive methodology.

Conceptualised as an arrangement of people and artefacts interacting through various creative phases and activities, this structures the process as stages of orientation, participation, evaluation-in-action, tool response analysis, and reflexive analysis.

I assess how the content, format, and tone of my methodological tools and techniques helped me to gather participants' drawn, written, and verbal insights, generate ideas, and make decisions whilst instigating understanding, empathy, rapport, consensus, and dialogue. These findings reinforce the designer's multifaceted reflexive role as an ethnographic explorer and storyteller, visual maker, strategic and empathic facilitator, and intuitive interpreter. Flexible and inclusive enough to navigate designers' and participants' intersubjective insights, I present the five-stage participatory-reflexive methodology as my original contribution to knowledge. I propose that this transferable framework will support designers as they engage with settings to elicit information from user and stakeholder participants, develop their own experiential and critical perspectives, and utilise their intuitive and expressive expertise to establish, manage, and sustain productive human-centred design relationships.

Presentation of submission

The format of this submission is the result of several iterations. Early prototypes indicated that presenting all the research as one volume could be overwhelming with regard to the reading experience and impractical in terms of printing and binding. I thus made the decision to elevate the practice and textual components as distinct aspects of the research that operate in tandem. Delineating the presentation of the thesis and portfolio in this way gives equivalent space and agency to these components.

My methodological tools and techniques are presented chronologically in the three A3 portfolio books – *Case study 1: Rothesay Townscape Heritage Initiative*, *Case study 2: Island wellbeing in Islay*, and *Case study 3: The Mackintosh Building user experience* – and the volume of appendices. In this thesis, I code each portfolio book respectively as Port-R, Port-I, Port-MB, and refer to the applicable sections of the appendices as App-R, App-I, App-MB. Following the five-stage participatory-reflexive methodology, these are preceded by initials in my discussions of orientation (o), participation (p), and evaluation-in-action (e) as stages of data collection in chapter three, and tool response analysis (t) and reflexive analysis (r) in chapter four. The codes direct the reader to the practice component of the submission and denote the positions of the corresponding tools and techniques within each book.

The presence of images in the body of the thesis is limited. In chapters one and two, I include a series of figures to illustrate examples of visual and participatory tools and techniques identified from the surrounding literature. In chapter four, I duplicate the tables of categorised concepts presented in the portfolio books to support my identification of emergent insights in tool response analysis. Additionally, I present fold-out diagrams at key points throughout the five chapters to accompany the development, application, and evaluation of my own five-stage participatory-reflexive methodological compass.

When designing the portfolio, I initially considered building an A2 sized plan-chest containing all the images and artefacts spanning the investigation, but rejected this on the grounds that it would impede portability and ease and cost of reproduction. The A3 slipcase containing the three portfolio books, thesis, and volume of appendices is the most successful iteration. Aligned to the five-stage participatory-reflexive methodology as the original contribution to knowledge, the sections of each book guide the reader through data collection and analysis in each unique case study to experience the materiality of the tools and techniques for themselves. I recognise that the A3 format and weight of the submission may still present problems of portability. For the reader's reference when these hard copies are not accessible, I therefore include a digital version of the complete submission on a USB memory stick within the slipcase.

Contents

1	List of figures
4	List of publications and seminars
5	Acknowledgements
7	Declaration
8	Introduction
	Visualising human-centred design relationships: a toolkit for participation
12	Research question and aims
13	Scope and objectives of case studies: placemaking and decision making through visual making
16	Thesis structure
20	Chapter one
	Mapping human-centred design problems: processes, participation, probes, and people
22	Tracing the landscape of human-centred design exploration
24	Premises and processes in human-centred design
32	Staging participation with actors and props
45	A social and material design-led inquiry
50	Participants and things: a question of designerly agency
57	Chapter two
	Crafting a participatory-reflexive methodological compass: positions, cases, practice, and stages
59	Philosophically underpinning the participatory-reflexive methodology
65	Describing a case for the case studies
69	Tools and techniques for orientation
73	Tools and techniques for participation
73	Tools and techniques for evaluation-in-action
80	Tool response analysis
81	Reflexive analysis

87	Chapter three
	Travelling through case studies: collecting data as souvenirs of human-centred design exploration
88	Case study one: Rothesay Townscape Heritage Initiative
97	Case study two: Island wellbeing in Islay
106	Case study three: The Mackintosh Building user experience
115	Chapter four
	Unpacking case study journeys: analysing participants' responses and reflexive interactions
120	Rothesay tool response analysis: annotation, interpretation, aspiration, regeneration
124	Rothesay reflexive analysis: visiting, visualising, consulting, conflicting
127	Islay tool response analysis: story, family, identity, community
132	Islay reflexive analysis: storytelling, sharing, playing, proposing
135	The Mackintosh Building tool response analysis: feedback, foreigners, shuttle bus, students
145	The Mackintosh Building reflexive analysis: critiquing, compromising, communicating, collaborating
148	Navigating content, format, and tone: tools for mediating an intersubjective dialogue?
155	Chapter five
	Exporting a participatory-reflexive methodology: repositioning human-centred tools, techniques, and designers
158	Advancing the five-stage participatory-reflexive methodology
168	Six recommendations for making, using, and interpreting human-centred design tools and techniques
176	Not turning a blind eye: navigating roles and responsibilities as a multifaceted human-centred designer
183	Designer as user; designer as toolkit

190	Conclusion
	Human-centred design exploration: eliciting information and building relationships
194	Designerly reflexivity: a toolkit for participation
197	Additional learnings and personal reflections
199	Limitations of the five-stage participatory-reflexive methodology
202	An audience for the research
203	Aspirations for future practice-led research
205	References

List of figures

Fig. 1. Cara Broadley, *Observational notes on the yogurt-eating status quo* [photograph]. Source: Amy Marsh (2011)

Fig. 2. Amy Marsh, *Brainstorming new yogurt-eating experiences* [photograph]. Source: Amy Marsh (2011)

Fig. 3. Cara Broadley and Liza David, *Prototyping Illustrated story yogurt pots* [photograph]. Source: Amy Marsh (2011)

Fig. 4. Catherine Docherty and Christina Kinnear, *Prototyping integrated yogurt straws* [photograph]. Source: Amy Marsh (2011)

Fig. 5. Bruce Archer, *Model of the design process* [diagram]. Source: The Design Council (2007a)

Fig. 6. Rachel Cooper and Mike Press, *The Internal Creative Process of Design* [diagram]. Source: The Design Council (2007a)

Fig. 7. John Clarkson and Claudia Eckert, *Constraints, Drivers and their influence on shaping the specific characteristics of a design process* [diagram]. Source: Clarkson and Eckert (2005)

Fig. 8. Peter A. Koen, Greg M. Ajamian, Scott Boyce, Allen Clamen, Eden Fisher, Stavros Fountoulakis, Albert Johnson, Pushpinder Puri, and Rebecca Seibert, *The new concept development (NCD) construct is a relationship model, not a linear process* [diagram]. Source: Paul Belliveau, Abbie Griffin, and Stephen Somermeyer (2002)

Fig. 9. The Design Council, *The Double Diamond design process* [diagram]. Source: The Design Council (2005)

Fig. 10. Elizabeth Sanders and Pieter Jan Stappers, *The front end of the design process has been growing as designers move closer to the future users of what they design* [diagram]. Source: Sanders and Stappers (2008)

Fig. 11. Alastair Macdonald, Gemma Teal, and Paula Moynihan, *Showing examples of the a) blank and b) completed storyboard frames* [photograph]. Source: Macdonald et al. (2010)

Fig. 12. Bill Gaver, Tony Dunne, and Elena Pacenti, *A cultural probe package* [photograph]. Source: Gaver et al. (1999)

Fig. 13. Bill Gaver, Tony Dunne, and Elena Pacenti, *A returned map showing zones of safety and fear in the Bijlmer* [photograph]. Source: Gaver et al. (1999)

Fig. 14. Kate Wall, Steve Higgins, and Heather Smith, *Example of template used to collect pupil views* [drawing]. Source: Wall et al. (2005)

Fig. 15. Cara Broadley, *Crafting my five-stage participatory-reflexive methodological compass: plotting tools and techniques to collect sociocultural information and examine relationships in human-centred design exploration* [diagram]. Source: Author (2013)

Fig. 16. John Rhys Newman (2006) *Untitled drawing* [drawing]. Source: Terry Rosenberg (2008)

Fig. 17. Joseph D. Novak and Alberto J. Cañas, *Concept Mapping* [photograph – detail]. Source: Bruce Hanington and Bella Martin (2012)

Fig. 18. Kim Dowd, Norman Lau, Gretchen Mendoza, and Hyori Park, *Stakeholder Maps* [photograph – detail]. Source: Bruce Hanington and Bella Martin (2012)

Fig. 19. Bruce Hanington and Bella Martin, *Thematic Networks* [photograph – detail]. Source: Bruce Hanington and Bella Martin (2012)

Fig. 20. Lilian Kong, *Prototyping* [photograph – detail]. Source: Bruce Hanington and Bella Martin (2012)

Fig. 21. Elizabeth Mitchell, *Scenario illustrations representing a visually impaired person walking in poor weather* [drawing – detail]. Source: Lois Frankel (2009)

Fig. 22. Cara Broadley, *Using my five-stage participatory-reflexive methodological compass 1: orientation in the Rothesay case study* [diagram]. Source: Author (2013)

Fig. 23. Cara Broadley, *Using my five-stage participatory-reflexive methodological compass 2: participation in the Islay case study* [diagram]. Source: Author (2013)

Fig. 24. Cara Broadley, *Using my five-stage participatory-reflexive methodological compass 3: evaluation-in-action in the Mackintosh Building case study* [diagram]. Source: Author (2013)

Fig. 25. Cara Broadley, *Using my five-stage participatory-reflexive methodological compass 4: tool response analysis, reflexive analysis, and comparative analysis of case study data* [diagram]. Source: Author (2013)

Fig. 26. Cara Broadley, *Case study facts* [table]. Source: Author (2013)

Fig. 27. Cara Broadley, *Conceptualising Rothesay residents' experiences, problems, needs, and aspirations from the Visual questionnaires* [table]. Source: Author (2012)

Fig. 28. Cara Broadley, *Conceptualising Islay pupils' stories from the Story postcards* [table]. Source: Author (2012)

Fig. 29. Cara Broadley, *Conceptualising notions of family present in pupils' Islay pre-pack and Islay workshop pack returns* [table]. Source: Author (2012)

Fig. 30. Cara Broadley, *Conceptualising GSA Enterprises' experiences of the Mackintosh Building user groups* [table]. Source: Author (2012)

Fig. 31. Cara Broadley, *Conceptualising GSA Enterprises' responses to Prototype foreign visitor feedback tools 1, 2, and 3* [table]. Source: Author (2012)

Fig. 32. Cara Broadley, *Conceptualising GSA design students' experiences, problems, and ideas* [table]. Source: Author (2012)

Fig. 33. Cara Broadley, *Calibrating my five-stage participatory-reflexive methodological compass: evaluating tools, techniques, processes, relationships, and roles to communicate the original contribution to knowledge* [diagram]. Source: Author (2013)

List of publications and seminars

Cara Broadley and Marianne McAra (2013) 'Making, using and interpreting design probes: how subjective is participation?', in *Proceedings of The 2nd International Conference for Design Education Researchers*, DRS // CUMULUS, Oslo, May 2013, 1432–1452

Cara Broadley (2012) 'Making and using design probes: exploring the multiple roles of the designer', in *Processes, Outcomes, Pathways and Products (POPP): A Scottish Practice-as-Research Symposium*, Glasgow, November 2012

Cara Broadley (2012) 'Observing, visualising, consulting, and empowering communities', in *Scottish Government lunchtime seminars*, Edinburgh, September 2012

Cara Broadley (2012) 'Island exports: Cultural probe creation as a method of design organisation and collaboration', in *The 28th European Group for Organisational Studies Colloquium*, EGOS, Helsinki, July 2012

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Declaration

I, Cara Broadley declare that the enclosed submission for the degree of Doctor of Philosophy and consisting of joint portfolio and textual dissertation meets the regulations stated in the handbook for the mode of submission selected and approved by the Research Degrees Sub-Committee.

I declare that this submission is my own work, and has not been submitted for any other academic award.

Cara Broadley
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INTRODUCTION

Visualising human-centred design relationships: a toolkit for participation

Tools and techniques exist to advance a democratic, inclusive design process that responds to the experiences and needs of users and stakeholders. Don Norman and Roberto Verganti maintain that human-centred design processes operate through iterative stages and contain methods to support exploration, idea generation, and the proposing and testing of innovative solutions (2012: 2). Anticipating the expansion of a range of toolkit resources in 2003, design researcher Bruce Hanington assessed the growing body of participatory methods available to the human-centred designer:

...when participants are invited to assist in research by engaging in a creative activity, the response is likely to be more favorable than when faced with a request to fill out a survey or take part in an interview. Creative methods are particularly appropriate during generative research, often referred to as projective because of their success in uncovering needs and desires that may be unknown even to the user, and that are difficult to articulate when probed for using traditional methods.

Hanington, 2003: 15

These principles were contextualised in a design masterclass I attended and which was led by former director of the global innovation consultancy IDEO, Colin Burns (2011). Presented with an imaginary brief, myself and my fellow designer participants observed each other eating yogurt and made written notes before categorising associated problems, opportunities, insights, needs, and themes. We then used sticky notes and marker pens to brainstorm potential new products and services, voted for the most favourable ideas, and built prototypes to envisage new forms of packaging with multifunctional lid-spoons, integrated straws, and illustrated stories (Figs 1–4).

- Scraping yoghurt from underside of lid
- and from interior rim
- a LOT of stirring
- Long process of taking spoon out of mouth
- spoon licking
- handle licking
- holding spoon in left hand
- Scraping yoghurt from inside walls of pot
- trying to eat every last drop
- VERY clean pot
- folding lid and leaving it in the pot.

Fig. 1. Cara Broadley (2011) *Observational notes on the yogurt-eating status quo* [photograph]

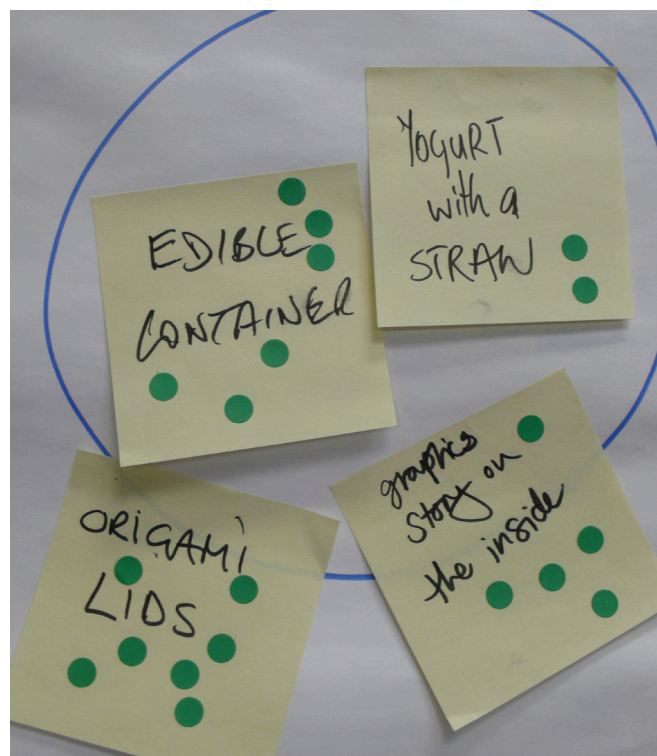


Fig. 2. Amy Marsh (2011) *Brainstorming new yogurt-eating experiences* [photograph]



Fig. 3. Cara Broadley and Liza David (2011) *Prototyping illustrated story yogurt pots* [photograph]

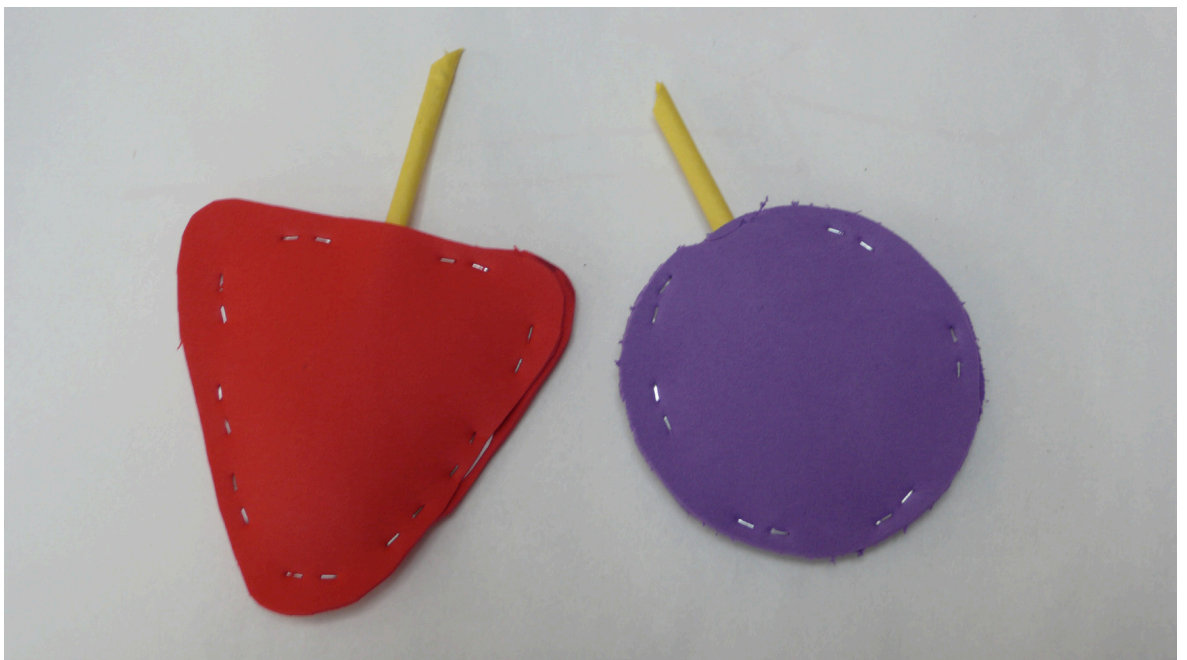


Fig. 4. Catherine Docherty and Christina Kinnear (2011) *Prototyping integrated yogurt straws* [photograph]

Like Hanington, Burns attempted to demonstrate how observational, empathic, and tactile methods can assist human-centred designers in producing outcomes derived from users' latent needs. Excited by the prospect of gleaning Burns' illustrious insights, I was in the early stages of framing my PhD and embarked on the masterclass with an open and curious mind. However, with participation came criticality. While I had used observation techniques in my previous research, Burns' recommendations to record my partner's yogurt mishaps and triumphs through writing seemed to neglect the emotive power of visual documentation. As a designer who makes images, my instinct was to draw, or to take poorly composed photographs at the very least. When proposing and selecting ideas for the yogurt revolution, I appreciated Burns' *no-idea-is-too-crazy* mentality, but had already grown weary of these sticky, luminous paper squares' presence in every design studio I had recently entered. I wanted to learn about new methods; I wanted to hear about Burns' own yogurt-specific methods. The prototyping stage exemplified the wealth of ideas that materialise from watching users and engaging in collaborative thinking and making. Yet as a singular PhD student, I did not have a team of designers on hand to support me in my research. I imagined how I might develop and incorporate these steps, but pondering Burns' facilitational practice, I soon became confused over our roles. What ideas could he have contributed? What observations did he make of us participants, and did these enrich his research? Was I destined to be a facilitator, training others rather than designing?

Reflection on my subjective experience as a participant in the workshop, my professional practice as an illustrator and designer, and my academic training in creative research led me to interrogate the human-centred designer's multifaceted position. Questioning agency and authorship in the midst of participation and collaboration, novelist and critic Geraldine Bedell contends that broad views and conflicting definitions have skewed disciplinary and public perceptions of contemporary design practice (2005). In 2006, Burns worked with Hilary Cottam, Chris Vanstone, and Jennie Winhall to define the UK Design Council's interdisciplinary and socially inclusive transformation design, and in doing so, suggested that as user and stakeholder participation continues to escalate, the

designer is increasingly viewed as a facilitator of the process and an analyst of its outcomes (Burns et al., 2006: 14, 18). Since then, design researcher Tom Inns has positioned the designer as a negotiator of value, facilitator of thinking, visualiser of the intangible, navigator of complexity, mediator of stakeholders, and coordinator of exploration (2010: 24–26). To manage their multiple roles, Marc Steen urges human-centred designers to acknowledge the presence of reflexivity and adjust to the intricacies of simultaneously working in and studying the design process (2008: 69). These tensions inform my investigation of creative methods and their impact on human-centred design relationships and roles.

Research question and aims

The main aim of the research is to understand how designers can use their creative practices to devise methods capable of generating information and establishing relationships with user and stakeholder participants in the exploratory phase of the human-centred design process. Critiquing existing methodological approaches identified from the wider field of human-centred design and foregrounding my own illustration and design practice as the central driver of the investigation, the research question – *which aspects and attributes of visual and participatory tools and techniques support designers in balancing their own subjectivity with the experiences and needs of participants* – examines the specific characteristics of such methods and how they evidence the designer's reflexive competencies to build productive social bonds in the design team. This is affiliated closely with the secondary research aim to assess the implications of making, using, and interpreting visual and participatory tools and techniques on my own position within the exploratory process and the role of the human-centred designer in the broader discipline. As such, my original contribution to knowledge is an adaptable and flexible five-stage participatory-reflexive methodology to help human-centred designers engage with participants whilst employing their own intuition and expression to construe intersubjective insights and direct the process towards subsequent phases of collaboration and design development. Writing in

the first person, I provide an intimate, immersed, and critical narrative account of three case studies which frame human-centred design in its initial exploratory stages.

Scope and objectives of case studies: placemaking and decision making through visual making

Through the 'Designing for the 21st Century' initiative, Inns examines a global shift in design from the development of products, spaces, images, and their surrounding technologies to an interdisciplinary inquiry that tackles complex sociocultural problems (2010: 17–22). This shift led the research to identify an environmental regeneration initiative in the Scottish town of Rothesay, cultural identity and community wellbeing in the Scottish island of Islay, and the user experience of The Glasgow School of Art's (GSA) Charles Rennie Mackintosh Building as case study inquiries, set against GSA's Institute of Design Innovation. Comprising a cluster of design practitioners and researchers, as well as three Masters in Design Innovation programmes (MDes Design Innovation and Citizenship, Environmental Design and Service Design), the Institute of Design Innovation repositions the idea-generating and problem-solving aspects of the human-centred design process in diverse contexts to establish new codes of professional practice, reinforce interdisciplinary collaborations, and have a positive economic effect:

Through design innovation we view issues from a variety of angles, considering the economic, socio-cultural and behavioural factors that play into successful innovation. We believe that for innovation to be sustainable, it needs to evolve through direct engagement with the people for whom it is designed. We are experts in creatively directing an inclusive and iterative process, working with people to develop and prototype ideas that lead to robust solutions and valuable outcomes.

The Glasgow School of Art, 2013a

As a joint initiative conceived by GSA and The Highlands and Island Enterprise, The Centre for Design Innovation applies human-centred design processes and methods to identify problematic issues affecting rural businesses and communities, discover unmet needs, and propose and implement conceptual solutions (Highlands and Islands Enterprise, 2010). The director of the Institute of Design Innovation, Irene McAra-McWilliam, conceives this as a 'Distributed City' that seeks to generate income in this geographic region by utilising local resources and skills to negotiate networks of aspirational communities (2009: 70–71).

These premises have links to placemaking – a holistic strategy geared towards improving the appearance, functionality, and identity of the environment through collaborations with local people and expert stakeholders (Project for Public Spaces, 2012). Sharing these ideals, Greenspace Scotland is an independent charity established to readdress the quality of life in Scotland through reorganising and reviving the environment (2011). Confirming the role of design in enhancing urban and rural locations, The Scottish Government maintain that placemaking from a design-led perspective attains social cohesion and economic sustainability (2010: 11).

The Design Council and the Commission for Architecture and the Built Environment (CABE) adopt a participatory approach to neighbourhood planning, involving residents in decision-making processes through 'organising, mapping and evidence, telling your story, pulling it together and making it happen' (2012). Glasgow-based design agency Pidgin Perfect build on these stages by initiating dialogues with communities surrounding their interactions with the natural and built environment. Experimental creative methods are central to their practices and are evident in the 'Monuments that Move me' project (2012). Upon being led around north Glasgow to explore their native perceptions of its landmarks and heritage, the young participants' experiential insights inspired a large collective map and series of clay models that were later exhibited publicly.

Such emergent design practices formulate participatory methods to help regenerate and redefine public spaces, neighbourhoods, and towns. In 1989, architects Stanley King, Merinda Conley, Bill Latimer, and Drew Ferrari employed the term co-design to describe their environmental community consultation workshops. In this, they stress how the designer operates as a visual conductor, interpreting and sketching figurative visions of residents' insights and aspirations (1989: 7–8). As the following passage highlights, creative exercises can externalise participants' local knowledge and elicit conversations in an accessible way:

The point of the drawing exercise is to lessen participants' fear of plans, maps, and other drawings normally found in an architect's office. In addition, the participants then feel less inhibited to comment on each other's drawings and to evaluate the different lifestyles the maps portray. This emphasis on visualisation by drawing is user-friendly and encourages participation.

King et al., 1989: 163–164

Encouraging public participation and creative expression, the architects' visual skills negotiate a communicative role for images and artefacts in the process of placemaking. Yet, in spite of King et al.'s recontextualisation of drawing practice in design, these examples echo my misgivings of the design masterclass: they somewhat suppress the flexibility of visual and participatory methods across the domain of human-centred design, thus overlooking their effect on the designer's authorship and the relationships they form with participants.

The Institute of Design Innovation and the concept of placemaking provide scope for the case study settings and objectives. I make, use, and interpret a variety of tools and techniques to engage with user and stakeholder participants, understand the key issues they face living and working in these environments, and consider how their experiences can be improved. This contributes to the Institute of Design Innovation's aims to enhance community wellbeing through transferable

human-centred design processes. Furthermore, the case studies align visual communication techniques with an exploratory human-centred ethos, at GSA and beyond. As I go on to signpost, I use my illustration and design practice across all methodological stages, documenting and discussing its development respectively in the portfolio and thesis chapters.

Thesis structure

In chapter one – *Mapping human-centred design problems: processes, participation, probes, and people* – I provide an overview of human-centred design. Evaluating a selection of diagrammatic design process models, I consider their limitations with regard to insight gathering, idea generating, and decision making in human-centred disciplines. I then draw from the development of participatory design and the many toolkits available to critique a range of creative methods deemed capable of stimulating information and advancing the exploratory process. Subsequently, I consider how such visual and participatory tools and techniques impact upon the relationships designers form with user and stakeholder participants, and on their own professional roles. This highlights affiliations with ethnography and visual anthropology, allowing me to integrate notions of sociomateriality into human-centred design activities. I assert that as creative expression is predominately sought from users and stakeholders, the design process models and the methodological toolkits overlook the reflexive position of the designer and their abilities to enrich participation.

I develop the methodological fit of the constructivist paradigm to underpin practice-led human-centred design research in chapter two, *Crafting a participatory-reflexive methodological compass: positions, cases, practice, and stages*. Providing a rationale for carrying out three case studies and placing these at the centre of my own methodological compass, I then explain how tools and techniques emerge through and are embodied by my design practice. Illustrated diagrammatically, the compass extends five branches that correspond to each

stage (Fig. 15). In data collection, these comprise my orientation in the case study settings to understand local issues, my engagement with users and stakeholders in the participation stage to gather their parallel experiences, and my evaluation-in-action of their responses to suggest alternative services and systems. I conclude the chapter with a discussion of tool response analysis and reflexive analysis as the fourth and fifth methodological stages. This methodology seeks to interpret participants' drawn, written, and verbal responses as sociocultural information, and to reflexively evaluate the interactions of designers, users, stakeholders, images, and artefacts.

Directing the reader to the portfolio and appendices, I provide chronological, descriptive accounts of data collection in the three case studies throughout chapter three, *Travelling through case studies: collecting data as souvenirs of human-centred design exploration*. In the Rothesay case study, I explain how the visual mapping techniques, observational photographs, and experiential drawings I created and used during orientation inspired a questionnaire made to collect residents' experiences and a proposed service to promote community cohesion (Port-Rope; App-Rope). Focusing on participation in the Islay case study, I discuss how an anecdotal family story formed the basis of an illustrative postcard that was sent to high school pupils as part of an introductory design probe pack. I go on to specify how their responses were evaluated and informed my proposal for a family-based community initiative (Port-lope; App-loe). In the third case study, I demonstrate how I used my drawn observations and interpretations of the Mackintosh Building public tours as interview prompts to exchange insights with stakeholder staff. My creation of a visual transcript during evaluation-in-action illuminated opportunities to collect feedback from foreign visitors in new ways and to investigate the student experience of the building through a co-design workshop (Port-MBope; App-MBe).

Chapter four – *Unpacking case study journeys: analysing participants' responses and reflexive interactions* – is structured by the fourth and fifth methodological stages. Developed as a bespoke permutation of content analysis, tool response

analysis resonates with designers Bill Gaver and Tuuli Mattelmäki's views that the eclectic results of design probes afford the designer's intuitive interpretations (Gaver et al., 2004; Mattelmäki, 2006). Assimilating participants' drawn, written, and verbal comments, I qualitatively identify thematic patterns, conceptualise and categorise these in a series of tables, and quantitatively determine the dominant emergent insights (Port-Rt, Port-It, Port-MBt; App-Rt, App-It, App-MBt). My second analytic mode, reflexive analysis, is framed jointly by autoethnographer Carolyn Ellis' discussions of cultural stories (2004) and sociologist Norman Denzin's use of critical events and epiphanies to explain narrative accounts (1989). Supplementing the information collected on and through the tools, I create autoethnographic drawings to interrogate my subjective experiences of each case study. These images appropriate stylistic and compositional devices to reconstruct the phases and activities of the human-centred design process and communicate anecdotal, experiential insights that were prompted by the tools, but not recorded directly by them (Port-Rr, Port-Ir, Port-MBr). Layering the findings of both modes of analysis, I assess the tools' and techniques' abilities to inform and inspire the exploratory process.

In chapter five — *Exporting a participatory-reflexive methodology: repositioning human-centred tools, techniques, and designers* — I evaluate my methodological images and artefacts and advocate a practice of human-centred design that responds iteratively and serendipitously to designers' and participants' creative interactions. Challenging the prescriptive nature of the toolkit resources, I present six recommendations for human-centred designers to follow when making, using, and interpreting visual and participatory tools and techniques. I then consider my changing role throughout the research and reposition the human-centred designer as an ethnographic explorer and storyteller, a visual maker, a strategic and empathic facilitator, and an intuitive interpreter. Advancing reflexivity as a practical stance through which human-centred designers can understand their positions as practitioners and analysts, each role propounds an awareness of the designer as a partial insider and user of the setting, possessing the expertise, agency, and authorship to disseminate the insights of others. I propose that permutations of

these tools, techniques, and roles within such a flexible methodological framework are capable of constructing intersubjective sociocultural insights and strengthening productive human-centred design relationships.

Cementing the five-stage participatory-reflexive methodology as the original contribution to knowledge, I conclude the thesis by providing a summary of the text, practice, methods, and findings and discuss how they address the research questions and aims. As a designer working in the process, a researcher analysing the process, and a student learning from the process, I set out the limitations surrounding the research and acknowledge additional learnings, discoveries, and reflections gleaned from the investigation. I extend the five-stage participatory-reflexive methodology's application for students of human-centred design and expound its benefit to practitioners and academic audiences, as well as organisations undertaking placemaking and community-centred initiatives. I consider avenues of research that the inquiry has opened up and identify ways that the methodology and recommendations can support further investigations in human-centred design practice and research.

ONE

Mapping human-centred design problems: processes, participation, probes, and people

Developing the research question and aims in this chapter, I begin by charting the historical development of human-centred design as the broad field in which the research is situated. This provides grounds for processes that collect users' and stakeholders' experiences, problems, needs, and aspirations as data to inspire innovative solutions. I consider how this rationale has informed various diagrammatic design process models and their strengths and weaknesses in human-centred contexts.

I then appropriate definitions from participatory design to investigate how designers engage with users and stakeholders to seek understanding, empathy, rapport, consensus, and dialogue. I assess the toolkit resources available to human-centred designers and identify generic and specific methods used to elicit information and foster relationships. In response, I assert that the toolkits limit the designer's methodological innovation and suppress their intuition and creative expression.

Locating parallels between design and ethnographic research, I explore both disciplines' opposing goals to respectively understand sociocultural settings, and to intervene and change them. I evaluate the practice of applied visual anthropology and debates surrounding the researcher's images and artefacts as methodological devices. I then draw from actor-network theory as an approach that examines the interactions between people and artefacts and go on to position sociomateriality as an innate aspect of human-centred design, through which creative methods structure communal activities.

Highlighting multiple roles and a corresponding neglect of practitioner and researcher reflexivity, I propose that the discipline's focus on understanding

processes and methods has obscured the human-centred designer's expertise. When they create, use, and interpret visual and participatory methods, a rich intersubjective dialogue is stimulated with users and stakeholders. This argument informs my selection of methodological tools and techniques to support the exploratory human-centred design process in chapter two.

Tracing the landscape of human-centred design exploration

The landscape of design practice, education, and research is in a constant state of flux. In 1992, design researcher Richard Buchanan acknowledged the effect of multiple definitions of design and cited four areas that resonate with members of the public and professional designers alike: symbolic and visual communications, material objects, activities and organised services, and systems or environments for living, working, playing, and learning. This 'Doctrine of Placements' repositions once passive audiences as active participants in the co-creation of products and services (Buchanan, 1992: 9–12). Around this time, former rector of the Royal College of Art, Christopher Frayling, drew comparisons of research 'into, through and for' art and design (1993). Considering how the proliferation of practice-led PhD programmes has given way to the dissemination of knowledge embodied in images and artefacts, Frayling argued that the once dominant image of the designer as a 'style warrior – superficial, trendy, obsessed with surfaces and signs' negates the full integration of academic research and design practice (1993: 4–5).

Since Buchanan and Frayling's discussions, design research has advanced significantly and its application in a multitude of public settings is now commonplace. As chairman of The UK Design Council, Sir George Cox underlines how designerly creativity can propel business strategies and help to revive the British economy (2005). To implement new ideas and bring about innovative change, Cox emphasises the social and commercial benefits of the design process, explaining that it 'shapes ideas to become practical and attractive propositions for users or customers' (2005: 2). Instead of designing from the constrained perspective of the client's brief, designers now accommodate the complexities of designing for society and embrace new collaborative ways of working, as designers Anne Chick and Paul Micklethwaite summarise:

A design outcome may not always be a physical, tangible product. It may be a service or a new way of doing things. In some cases, we may not need a new product, just a better way of integrating the products we

already have in order to serve our needs. Design is also too important, and too useful, to be used only by professional designers. The active participation of users in the design process can ensure more successful design outcomes. The emergence of open-source design is creating a collaborative remix culture in which the originator of an idea passes it on to others to take in new directions.

Chick and Micklethwaite, 2011: 35

Developing design practice for socioeconomic impact, designer Tim Brown distinguishes between traditional design making and innovative design thinking (2009: 3–8). While conceding that the designer's expertise influences the direction of the process, Brown concurs that 'design has become too important to be left to designers' (Brown, 2009: 8). With the goal to extend human creativity on a global scale, design thinking imparts designerly principles to non-designers. Such practices have gained credence, and the interdisciplinary adaptation and contribution of design thinking promotes the profession as an attitude and a thought process (Brown, 2009: 7; Chick and Micklethwaite, 2011: 24).

Preceding the coining of design thinking, designers Don Norman and Stephen Draper (1986) conceived human-centred design processes that react to the needs of computer-based technology users. Attending to the routine practices of everyday life and the actions embedded in the design process itself, Norman later critiqued human-centred approaches to espouse an activity-centred process, characterised by the interactions it contains and the behaviours it strives to change (2006). Furthermore, in their recent evaluations of human-centred design's potentiality, Norman and Verganti differentiate between a gradual improvement of current situations (incremental innovation), and a disruptive recontextualisation of these to achieve unprecedented new solutions (radical innovation) (2012: 5–6). Within this, they reframe human-centred design as a philosophy, subsuming the iterative qualities of observation, ideation, testing, and 'getting close to users' (Norman and Verganti, 2012: 2, 11).

The terms user-centred and human-centred have filtered into design vocabulary to encompass many interconnected socially responsive subdisciplines including service design, interaction design, and experience design (Norman and Draper, 1986; Norman and Verganti, 2012). As Burns et al. profess, transformation design prioritises interdisciplinary collaboration and stakeholder and user participation to readdress broad issues such as environmental sustainability, infrastructure, crime, education, and healthcare (2006). A transformation design case study undertaken to improve the care of diabetes patients, for example, involved collecting the experiences and needs of GPs, councillors, nutritionists, and people with diabetes themselves, before co-creating alternative personalised systems of consultation and support (Burns et al., 2006: 13). According to designers Jane Fulton Suri and Sanders and Stappers, these contemporary processes redesign human interactions over the manufacture of material goods and emphasise 'purpose, not product' (Fulton Suri, 2005: 168; Sanders and Stappers, 2008: 11). Affirmed by designers Claudia Eckert, Alan Blackwell, Louis Bucciarelli, and Chris Earl, design's sharpened focus on improving public services and reconfiguring systems for living is accompanied by new human-centred relationships (2010: 34).

Premises and processes in human-centred design

Human-centred design practice and research integrates designers, users, and stakeholders into a democratic and iterative process of exploration and discovery. This rationale reflects the seminal writings of design theorist Victor Papanek, who argues that design is an intrinsic human capability with societal benefits (1984). Indeed, as Victor Margolin and Sylvia Margolin discuss, design was extended as a grand utopian ideal, yet initially, little attention was given to the structures, methods, and relationships it embodies in practice (2002: 24).

Building on historical conceptions of design activities, The Design Council evaluate a number of diagrammatic design process models that seek to promote designerly and interdisciplinary transferability whilst enhancing public access and understanding (2007a). Their chronological review begins with engineering designer and researcher Bruce Archer's examinations of design management (1963) through a linear sequence of analytical, creative, and executive phases, as is shown in Fig. 5. This is contrasted in Fig. 6 by Rachel Cooper and Mike Press' equally linear and descriptive representation of the designer's personal thought processes (1994). A pivotal example is shown in Fig. 7, in which designers John Clarkson and Claudia Eckert demonstrate how standardised processes are tailored to meet contextual demands by various 'constraints and drivers' (Clarkson and Eckert, 2005; The Design Council, 2007a: 5, 7, 9). Recognising criticisms of the design process as a rigid sequence of events, Peter Koen et al.'s 'New concept development construct' (2002) presents an apparently flexible and cyclical strategy for managing product design innovation, seen in Fig. 8. Concerned with identifying opportunities, generating ideas, and defining concepts in the 'fuzzy front end' of the process, a central engine accounts for the specific culture of the organisation while a surrounding perimeter of influencing factors advances the innovation process towards commercialisation (Koen et al., 2002: 8; The Design Council, 2007a: 11).

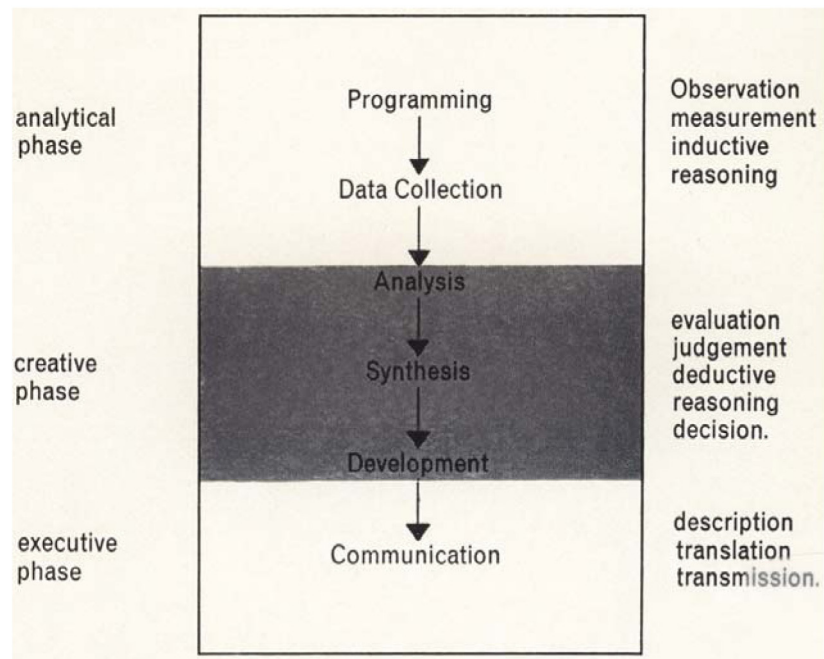


Fig. 5. Bruce Archer (1963) *Model of the design process* [diagram]

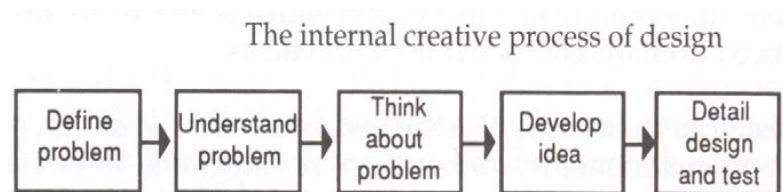


Fig. 6. Rachel Cooper and Mike Press (1994) *The Internal Creative Process of Design* [diagram]

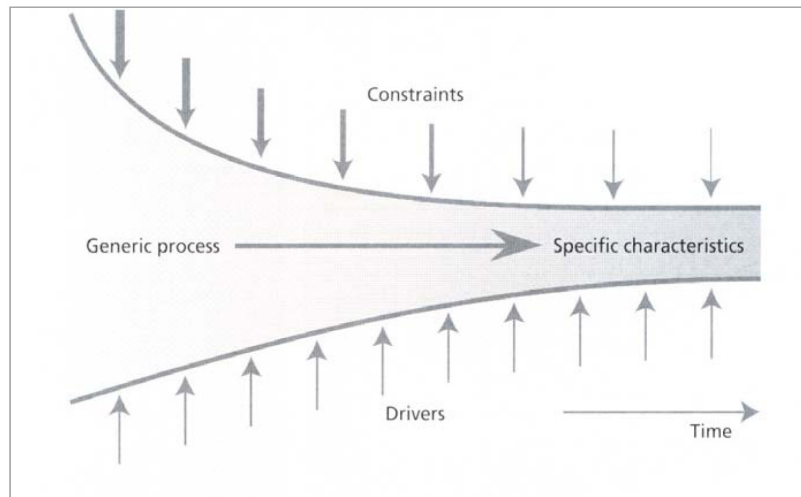


Fig. 7. John Clarkson and Claudia Eckert (2005) *Constraints, Drivers and their influence on shaping the specific characteristics of a design process* [diagram]

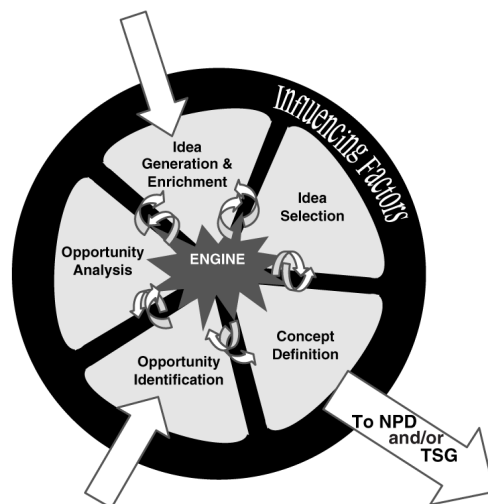


Fig. 8. Peter A.Koen, Greg M.Ajamian, Scott Boyce, Allen Clamen, Eden Fisher, Stavros Fountoulakis, Albert Johnson, Pushpinder Puri, and Rebecca Seibert (2002) *The new concept development (NCD) construct is a relationship model, not a linear process* [diagram]

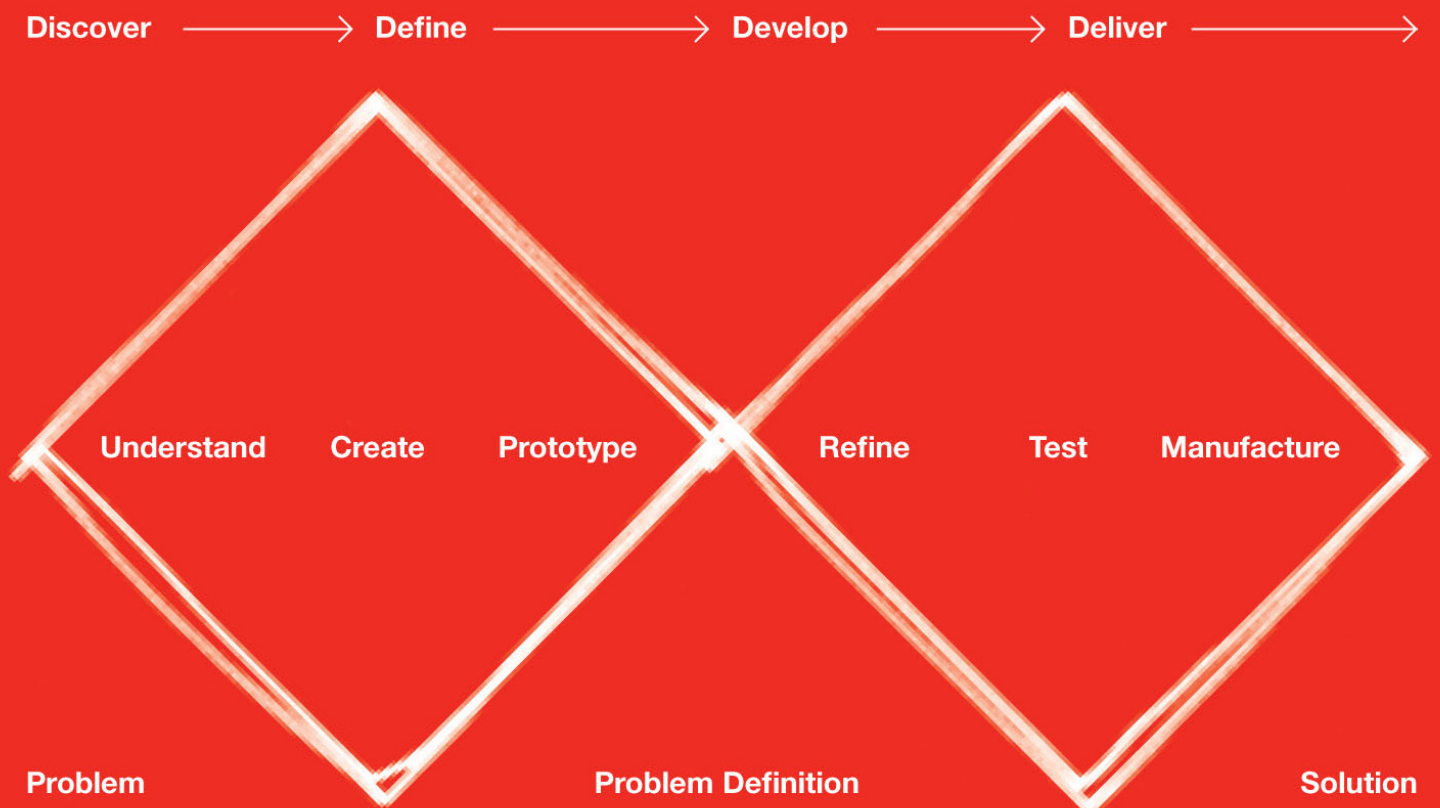


Fig. 9. The Design Council (2005) *The Double Diamond design process* [diagram]

This comparison of models accentuates affinities between the process of design and the process of research, in which problems are identified and systematically interrogated. For the individual practitioner-researcher, their process is shaped by imposed time scales, additional professional commitments, personal understandings and abilities, and other external and internal forces. Whilst individually created for specific purposes and set against different backdrops, the models collectively neglect the impact of social relationships and the designer's idiosyncratic practice on the direction of the process. The Design Council's survey thus illuminates the opacity and impenetrability of design process models when applied to human-centred practices.

Envisaging a concise framework comprising skilled designers on one hand, and the interdisciplinary expertise and insight of users and stakeholders on the other, The Design Council expound the flexibility and transparency of their 'Double Diamond' process model (2005; 2007b). Presented diagrammatically in Fig. 9, this supports designers in discovering broad sociocultural issues, defining the study's focus through prototyping techniques, developing strategies to address identified problems, and delivering a set of solutions back to the clients, users, and stakeholders for their feedback before implementation (The Design Council, 2007b).

Adhering to these premises, Brown identifies an inspiration phase, where designers immerse themselves in the context of inquiry and collect information to spark investigatory focus (2009: 16). Next, in the ideation phase, designers generate and test a wide range of alternatives to existing products, services, and systems. Following the Double Diamond's notion that solutions are achieved through stages of divergence (concepts are unpacked to explore multiple routes towards resolution) and convergence (concepts are stated and refined), Brown maintains that design teams adopting loose and flexible processes will together devise creative and innovative outcomes (2009: 66–67, 82). Once externalised and reviewed, emergent possibilities are distilled and the optimum opportunity is selected as an intervention to implement in the field (Brown, 2009; Steen, 2012).

Evidencing the Double Diamond's application in product and service innovation, The Design Council present a series of case studies demonstrating how eleven global brands including LEGO, Starbucks, Xerox, Yahoo!, and BT manage their design processes (2007b). By relating abstract methodological concepts to specific procedures and outcomes, The Design Council attempt to persuade us that the Double Diamond is reshaped to meet different commercial and social demands, and can be adapted across the entire discipline of design. Yet upon closer examination, rather than existing as a transferable structure that can be modified to suit any and every design project, the Double Diamond presents a dichotomy. The impetus placed on the divergent discovery stage as making best use of the designer's expertise and skills corresponds with my study of the human-centred design process in its initial exploratory stages (The Design Council, 2007a: 10). Alluding to a disconnect between design practice and design research however, its stages are both prescriptive in their definitions and ambiguous enough to obscure the human interactions that occur in participatory activities.

This confirms a need for human-centred designers to be receptive and sensitive to the emotional factors underlying subjective user experience and to incorporate insight, observation, and empathy into the process (Brown, 2009: 40; Burns, 2011). The process' success depends on the designer's capacity to approach the problem from a user perspective (looking), visualise information (make things visible), and rapidly evaluate ideas (prototyping) (Burns et al., 2006: 18–19). It therefore follows that the designer's use of visual methods can enhance their communication with non-designers, rendering design processes more open to participation (Fulton Suri, 2005: 162; Burns et al., 2006: 21).

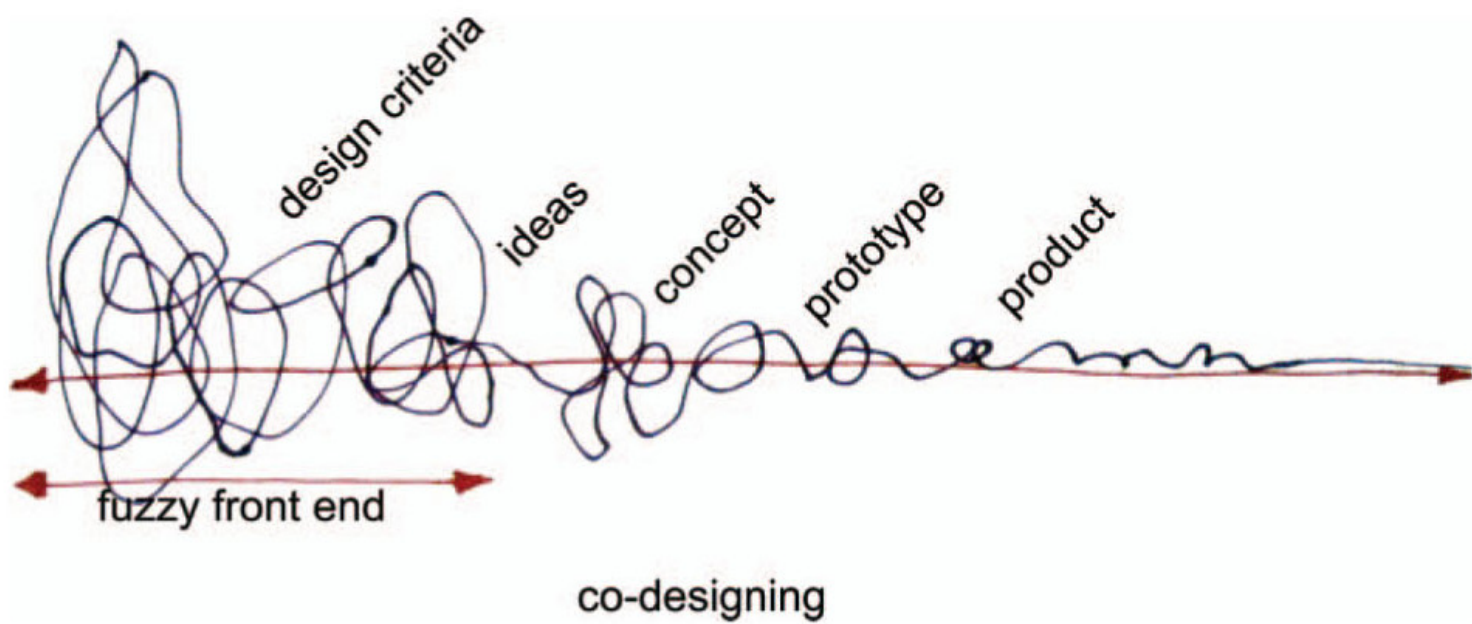


Fig. 10. Elizabeth Sanders and Pieter Jan Stappers (2008) *The front end of the design process has been growing as designers move closer to the future users of what they design* [diagram]

Interrogating the complexity and ambiguity of the 'pre-design' phase, Elizabeth Sanders and Pieter Jan Stappers present their illustrative timeline to conceptually visualise the fuzzy front end as an entanglement of activities that characterise the designers' iterative and spontaneous creative practices, as is shown in Fig. 10 (2008: 6). They recognise that this broad and open-ended phase offers a supportive space for scoping the design context and clarifying research aims and questions. While the form of design outcome may still be unclear here, the fuzzy front end supports designers in aligning their project with the needs of prospective end users and thus frames and directs the process towards increasingly defined co-design stages of concept development, prototyping, and production (Sanders and Stappers, 2008: 6–7). As central objectives in focusing the process' initial divergent stages, I view such activities as insight gathering (assimilating and interpreting inner meaning surrounding the design setting in its current state), idea generating (individual or collective creative thinking to imagine future scenarios), and decision making (synthesising ideas and considering practical and logistical implications before making an informed choice on the most suitable next steps). I go on to consider various methods that human-centred designers have used through these phases in the exploratory process.

Staging participation with actors and props

The contextual interactions of users and designers are central to the participatory design movement. Participatory design emerged in Scandinavia during the 1960s and 1970s and was epitomised by designers Susanne Bødker, Pelle Ehn, Dan Sjögren, and Yngve Sundblad in the UTOPIA project (1981–1985) to politically address organisational power imbalances through the user's innate skills. This supported participants from the Nordic Graphic Workers' Union and researchers from Sweden and Denmark to formulate democratic, pragmatic solutions and regain human accountability in light of technological advancements (Ehn, 1989; 1993; Bødker et al., 2000). As described by Elizabeth Sanders, Eva Brandt, and Thomas Binder in their typology of participatory design practice (2010),

approaches have since been adapted to address wider sociocultural issues and integrate potential end-users and interdisciplinary experts in a democratic process of innovation. In advocating participatory design premises, Sanders and Stappers recommend that sharing ideas enables 'collective creativity' and produces solutions that respond to designers' and participants' first-hand insights (2008). Questioning the designer's motivations for involving users and stakeholders as participants, Steen believes that their political, ethical, creative, practical, economic, and commercial objectives influence the degree to which participation and collaboration are harnessed, and the quality of the resulting relationships (2012: 5). Consequently, the role of the user evolves from a consumer, to a respondent, to a participant, and in some cases, to a co-designer, who actively contributes to the design process and its outcomes (Sanders and Stappers, 2008: 12).

The practice of co-design is deemed a contemporary progression of the Scandinavian participatory design tradition in which non-designers are initiated as collaborative partners who work with the design team to jointly conceive alternative future products, services, and systems (Sanders and Stappers, 2008; Steen, 2011). It can, as Sanders and Stappers point out, also refer to the shared activities of collaborating designers (2008: 6). Originating from a business and marketing perspective through Coimbatore Krishnarao Prahalad and Venkat Ramaswamy's concepts of co-creation (2004), the former definition of co-design accounts for the user-centred personalisation of design outcomes, and demands a redistribution of authorial control from the expert designer to encompass the collective knowledges of a wider interdisciplinary team (Sanders and Stappers, 2008: 8–9).

Many practitioners and researchers acknowledge the blurred boundaries between co-design and participatory design and attempt to delineate their key features and practical implications. David Wang and Isil Oygur describe co-design as a 'heuristic structure for collaborative design' that contains five distinct components (2010: 356). According to their framework, such collaboration *in* design (emphasis in original) is characterised by at least two 'cultural-epistemic-praxis units' such

as disciplines, professions, corporations, or neighbourhoods, 'productive threads' of exchange between these units, the brokering of knowledge, iterative cycles of development, and the entire process should be tangible, documentable, replicable, and valid in order to trace the origins of the design outcomes (Wang and Oygur, 2010: 361–362). Sharing such ideas, designers Salu Ylirisku, Kirsikka Vaajakallio, and Jacob Buur recognise a need to reflect on and understand how innovative design concepts are generated in the early stages of the design process – the fuzzy front end – where the multiple perspectives, desires, and expectations of individual team members are often ill-defined (2007).

Steen (2011) positions participatory design as a broad form of human-centred design, in which designers devise methods to engage with users and stakeholders, understand their experiences, and consider how these can be enhanced. Yet as he points out, co-design activities also build on primary knowledge and expertise ('what is') to imagine preferable scenarios ('what could be') (Steen, 2011: 52). In King et al.'s community placemaking co-design projects, for instance, town residents shared their experiences of urban life with architects and planners, who in turn, contributed their expert understandings of environmental design and logistical considerations. To record and interpret this interdisciplinary dialogue, co-design artists sketched the team's collaborative and consensual aspirations for the town's future (King et al., 1989).

In 2009, Vaajakallio evaluated co-design activities and proposed that this fundamentally social and embodied practice originates from the dialogue that emerges when participants enact and describe their existing experiences through creative, expressive methods (2009). This fosters a non-hierarchical team mentality that empowers non-designers to contribute to innovative concept development. Primarily concerned with understanding the world as it is however, participatory design can be thought of as a research-led orientation in which designers gain an insight into participants lives (Steen, 2011: 48). As Steen recognises, both approaches are essential elements of human-centred design processes in which 'researchers and designers attempt to cooperate with or

learn from potential users of the products or services which they are developing. Their goal is to develop products or services that match users' practices, needs and preferences' (2011: 45). Taken together, the co-design stage can be thought of as evolving and advancing the participatory activities that occur in the initial exploratory phase of the process.

In this research I investigate how the exploratory phase of the human-centred design process is prompted and driven by the designer's creative practices, and in turn, I identify the aspects and attributes of their methodological tools and techniques that support their interactions with user and stakeholder participants. I therefore focus predominately on the impact of designerly practice on the qualities of these relationships and examine how the social bonds formed through preliminary participatory activities are essential when moving towards a more generative co-design phase. As such, I challenge Norman and Verganti's analysis of technologically-driven activities as the route towards radical design-led innovation (2006; 2012) in favour of Steen's discussions of creative and emotionally driven action in human-centred design (2008). To concur with designer Patrick Jordan's views, I acknowledge the participants in the design process primarily as people, rather than product or service users (Jordan, 2002: 12; Steen, 2012: 45–46). I align my investigation of materially mediated interactions, information, relationships, and roles with the participatory design ethos inherent in the wider sphere of human-centred design. This corresponds with Sanders et al.'s classification of participation as a human-centred phase of design based on acts of probing (eliciting data from participants), priming (orienting participants in the project), understanding (through a reciprocal dialogue), and generating (with a view to co-creating design opportunities) (2010: 2). Participation is thus not a series of disparate tasks, but, to develop Erling Björgvinsson, Pelle Ehn, and Per-Anders Hillgren's conceptions of design as a performance (2012: 103), a holistic event in which the above acts and scripts are improvised within a literal and metaphorical stage.

Participatory design has spawned a wealth of creative and generative methods constituting collaging, drawing, photography, and three-dimensional making tasks, which designers employ to interpret participants' experiences, ideas, and aspirations (Sanders and Stappers, 2003: 1). In assessing participatory design and design thinking, Björgvinsson et al. cite various designed artefacts including prototypes, mock-ups, design games, and models as stimulating communication and innovation (2012: 105). These methodological tenets can be traced back to the Design Methods Movement of the mid-20th century, of which engineering designers Bruce Archer (1963), Christopher Alexander (1964), Herbert Simon (1969), and John Chris Jones (1970) were key proponents. Derived from the 'Conference on systematic and intuitive methods in engineering, industrial design, architecture and communications' in 1962, the movement was reactive against the autonomy of the craftsman and proposed that the design process can be managed by dividing problems into smaller parts and analysed through rational scientific procedures, such as statistics and experiments. Highlighting the lack of methods to support the profession as it infiltrated wider society and as designers' roles diversified, Jones became increasingly concerned with human action and experience (1970: 32). Similarly, design researcher Thomas Mitchell notes Alexander's belief that design's rationalistic roots 'had become a toolkit of rigid methods that obliged designers and planners to act like machines' (Mitchell, 1993: 51). Many toolkit resources have since been developed, offering human-centred designers a host of methods to accompany insight-gathering, idea-generating, and decision-making activities.

Hanington illustrates the evolution of traditional interviews and questionnaires, to adapted ethnographic methods including observation, arriving at the wealth of innovative strategies currently being applied in human-centred design (2003: 13). The Design Council's website provides an inventory of social scientific methods alongside design-led tools deemed capable of discovering users' latent needs and desires. These include the assimilation and evaluation of multiple viewpoints in 'scribble-say-slap' group brainstorming, as I experienced in the design masterclass. Voicing and sharing as many new ideas as possible, 'participants

write down their ideas (Scribble) on sticky notes before shouting them out (Say) and sticking them up (Slap)' (Burns, 2011; The Design Council, 2013). Meanwhile, Roberta Tassi's 'Service Design Tools' (2009) and IDEO's 'HCD Connect' (2013) offer online directories of similar visual techniques to enrich the designer's understanding of user behaviour and transform insights into innovative design opportunities.

As a branch of The Royal College of Art's Helen Hamlyn Centre for Design, designingwithpeople.org advocate the use of storyboards, scenarios, and personas in textual or visual forms to provoke discussions with users and stakeholders and generate ideas for product, service, and system development (2013). Design researchers Alastair Macdonald, Gemma Teal, and Paula Moynihan from GSA exemplify these methods in hospital environments with a view to redesigning patients' mealtime experiences (2010). To visualise their own observations and data gathered from healthcare profession stakeholders, Macdonald et al. represented 49 different mealtime scenarios with Playmobil figures. In an exploratory workshop, stakeholder participants then annotated photographs of the scenarios with adhesive speech and thought bubbles. Arranged as an interconnected visual narrative of collective experiences, the images displayed the hospital staff's difficulties of providing multiple patients' care and a comfortable eating environment, and went on to suggest technological devices to alleviate such complexities (Macdonald et al., 2010: 4; Fig. 11).

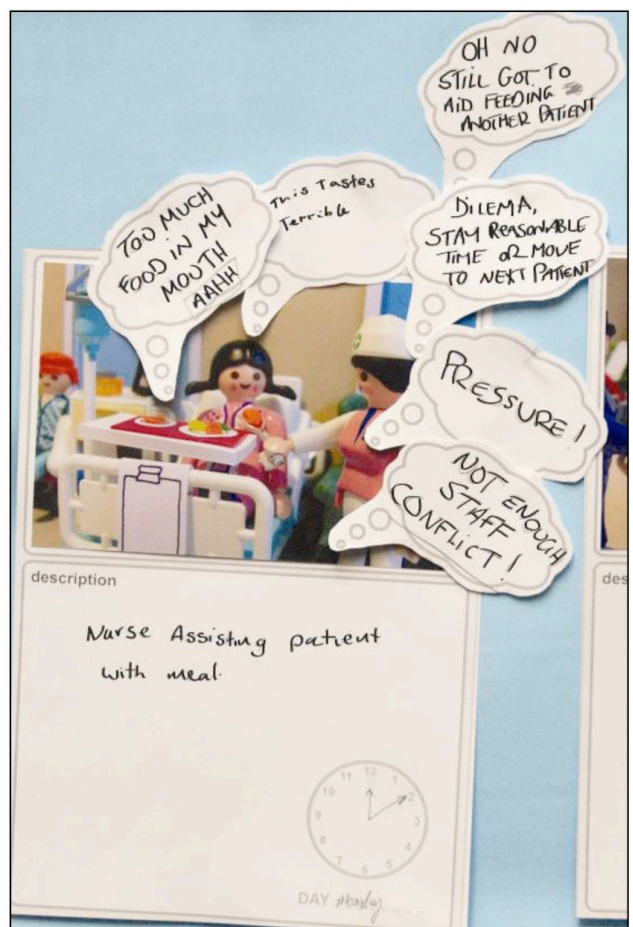


Fig. 11. Alastair Macdonald, Gemma Teal, and Paula Moynihan (2010) Showing examples of the a) blank and b) completed storyboard frames [photograph]

Explicating the optimum stage for each method and the information designers can expect in return, The Helen Hamlyn Centre for Design scaffold the design process by amalgamating The Design Council's Double Diamond (2005), Hugh Aldersey-Williams, John Bound, and Roger Coleman's seminal compilation of methods, 'The Methods Lab: User Research for Design' (1999), and Fulton Suri's premise of designing 'for, with and by' people (2007). Also borrowing from the sets of 'Method Cards' produced by IDEO (2002), their toolkit defines methods for evaluating gathered information (learn), observing the actions of users (look), engaging with users to collect information (ask), producing research tools to aid the process (try), and anticipating alternative scenarios (imagine) (Helen Hamlyn Centre for Design, 2013). Bruce Hanington and Bella Martin expand on these recommendations by identifying 100 methods assumed to be universal across the discipline of human-centred design (2012). In their toolkit textbook, a comprehensive description of each is contextualised by an example of its use in the field, judged against a list of criteria, and positioned within a framework akin to the Double Diamond (Hanington and Martin, 2012: 6–7).

Reminiscent of Burns' design masterclass (2011), Hanington and Martin urge designers to document users' routine behaviours and gain a first-hand understanding of settings through participant observation and shadowing (2012: 7, 90–91, 124–125, 158–159). These exploratory insight-gathering techniques are complimented by studio-based reflection. Various mapping devices are created to display relational views of concepts, whilst visualisations of user behaviours are portrayed as personas, storyboards, and scenarios. These images and artefacts offer a tangible touchpoint to structure conversations with stakeholders and cooperatively reconsider user groups and their requirements (Hanington and Martin, 2012: 30–31, 100–101, 166–167).

At this point, self-reporting survey techniques yield insightful data from participants. As Hanington and Martin discuss, innovative iterations of interviews and questionnaires include collage making and 'cultural probes' (2012: 34–35, 54–55). In 1999, designers Bill Gaver, Tony Dunne, and Elena Pacenti first used

this term to describe the sets of activity packages that they created and used in a series of community engagement sessions (1999: 22). Once provided with the postcards, maps, diaries, and disposable cameras shown in Fig. 12, participants were encouraged to interactively record aspects of their daily lives through drawn and written annotation. The completed map seen in Fig. 13 illustrates how one participant used coloured stickers and written commentary to convey their physical and emotional responses to defined urban locations. In turn, these tools enabled the designers to collect a wealth of qualitative data to underpin their proposals for site-specific technological devices and systems (Gaver et al., 1999: 27).

Elaborating on his extensive applications of cultural probes with designers Andrew Boucher, Sarah Pennington, and Brendan Walker, Gaver has since critiqued the method's adaptation by a multitude of research disciplines (2004). In this, Gaver et al. express their concerns that the cultural probe has evolved from an exploratory device employed in the design process to apprehend participants' subjective experiences (defined as 'probology'), to a specific tool for gathering precise answers to the researcher's questions (2004: 53, 56). Debating the interpretation of probe returns and their contribution to design solutions, Andrés Lucero, Tatiana Lashina, Elmo Diederiks, and Tuuli Mattelmäki point towards some general misgivings and concede that 'the large amount of data resulting from the probes may be perceived as fragmented, too detailed, or even sometimes irrelevant' (2007: 383). Yet in evaluating the materials accumulated in their studies of bathroom lighting systems, the design researchers appreciate the probes' capacities to evoke participants' experiences, emotions, and desires, thus suggesting requirements for the human-centred design process (Lucero et al., 2007: 389).

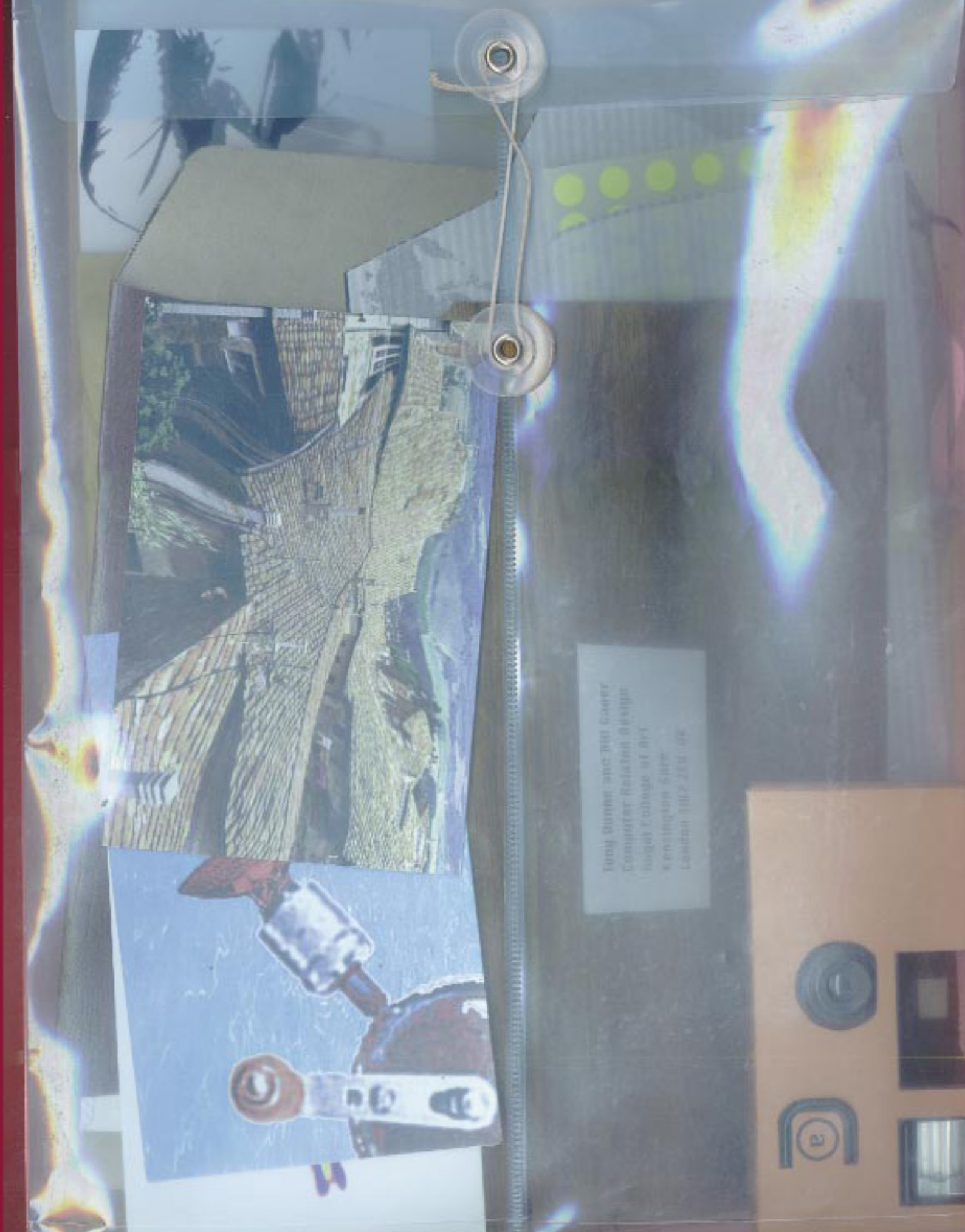


Fig. 12. Bill Gaver, Tony Dunne, and Elena Pacenti (1999) *A cultural probe package* [photograph]

In co-creating design solutions, the toolkits' characteristically visual and participatory methods strive to support each member of the team's input (Brown, 2009: 16). As such, the third stage in Hanington and Martin's framework is concerned with 'concept generation and early prototype iteration, involving participatory and generative design activities' (2012: 4–7). This designates techniques including affinity diagrams, card sorting, personas, content analysis, and interviews to advance design development and ideation (The Design Council, 2007b: 19).

Proposing multiple methods, advising designers on the optimum stages for their application, and predicting the kind of information that this will yield: the toolkits echo the rigid sequences of actions presented by the design process models. Concurring with my views, designers Jung-Joo Lee, Kirsikka Vaajakallio, and Tuuli Mattelmäki (2011) interrogate Hanington's original conceptions of innovative methods (2003) to examine students' experiences of learning, designing, using, and evaluating design probes and co-design workshops. On the whole, the students reported a degree of uncertainty due to the ambiguous aims of the probe method, descending into confusion and discouragement upon their receipt of inadequate, incomplete, and potentially meaningless returns from participants (Lee et al., 2011: 106). These observations affirm that the toolkits do not provide practical advice should the methods fail to meet the designer's expectations. Simultaneously, rather than being guiding, inspirational, and interpretative, the toolkits do not offer sufficient space for designers to devise intuitive methods in response to specific sociocultural settings.

As I elaborate in chapters two and three, I am inspired by the precedents set by other designers and researchers when making, using, and interpreting tools and techniques, but their content, format, and tone are always determined by the unique conditions surrounding each design setting. Broadly intent on implementing final solutions, the toolkits' off-the-shelf methods seek to collect users' experiences and stakeholders' logistical knowledge as ready-made insights, culminating in a bank of information to progress the process through and beyond its exploratory

stages. In effect, the toolkits also fail to recognise the experiential nature of participation and the emergence of intangible qualities such as understanding, empathy, rapport, and consensus through dialogue. This critique outlines the need for methods to gather practical information and to foster productive relationships.

Focused methodological evaluations have accounted for attitudinal, emotional, and behavioural modes of engagement more holistically. Pertaining to Hanington's belief that creative tools allow participants to articulate and project their unmet needs, Elizabeth Sanders and Uday Dandavate have classified methods including collaging, user diaries, context mapping, and building three-dimensional models under the umbrella term of the 'Make Tools' (Sanders and Dandavate, 1999; Hanington, 2003). With their transparent connections to the physicality and function of design probes, these hands-on techniques enhance the designer's understanding of participants' lives, as elicited from what they say, do, and make (1999). Similarly, Mattelmäki and Battarbee attest that the creation, use, and verbal co-evaluation of 'empathy probes' stimulates social bonds and an open dialogue, helping designers gain an insider perspective of participants' experiences (2002: 268). In assessing the facilitation of design probes, designers Connor Graham and Mark Rouncefield consider how discursive participation builds relations, investigative participation assists users in examining their subjective experiences, and reflective participation encourages their communication of personal insights through the annotation of material artefacts (2008: 196).

Developing playful elements of participation, designers Martin Johansson and Per Linde explain how their card game tools encouraged participants' informal and expressive conversations and initiated enjoyment and rapport due to the method's 'non-constraining use of language' (2005: 11). In Michael Muller and Allison Druin's study of participatory interactions (2012), the design researchers state that innovative methods negotiate a metaphorical third space for designers, users, and stakeholders to conceptualise hybrid understandings, experiences, assumptions, and ideas, and a platform to reach compromise and consensus. Recounting their participatory design workshops with groups of teenagers in Hong Kong, designers

Denny Ho and Yanki Lee deem such intersubjective participation as achieving empathy with users, and therefore being capable of producing responsive solutions (2012: 74–75).

This notion of collective knowledge is framed methodologically and materially by Andrés Lucero, Kirsikka Vaajakallio, and Peter Dalsgaard in their 'dialogue-labs' studies (2012). Here, the designers appropriate Agger Eriksen's participatory design tools as basic materials (paper, clay, and pens) and pre-designed images and artefacts (printed cards and models) (2009). Investigating participatory design games and building on the use of the Make Tools, Vaajakallio notes that the ambiguity of her co-design workshop tools allowed their seamless adaptation in future sessions with diverse participant groups (Sanders and Dandavate, 1999; Vaajakallio, 2012: 83). Following these distinctions, tools and techniques can be generic and transferable to subsequent design projects, or actively designed as field/project specific (Eriksen, 2009; Lucero et al., 2012: 6). Lucero et al. observe that a diverse array of materials with varying levels of specificity and provocation gave way to 'a relaxed atmosphere since participants are not forced into activities they are not comfortable with', and stimulated 'a structured but flexible way in order to spark dialogue between the co-design participants and thus support idea generation' (2012: 19–20). I now go on to discuss this intertwining of designers, participants, and methods in more depth.

A social and material design-led inquiry

The toolkits and surrounding literature extensively advocate ethnographic methods to gain an understanding of user behaviour (IDEO, 2002; Hanington, 2003; Hanington and Martin, 2012). Stating the conflicting aims of ethnography and design ('one to understand, the other to transform'), Katja Battarbee points towards a negative 'separation of research and design', while computer scientist Paul Dourish insists that hybridised methods diminish the status of ethnographic fieldwork to a mere data collection exercise (Battarbee, 2006: 66; Dourish, 2006).

Design ethnographer Joachim Halse (2008) advances Steen's distinctions of collaboration and participation (2011: 52) by affirming that socially situated, culturally specific design inquiry is embodied by past, present, and future experiences. Through performing design activities in the liminal spaces between people and artefacts, everyday practices function as a springboard for innovation (Halse, 2008: 22).

Endorsing action-based social intervention, ethnographer Sarah Pink details how applied visual anthropology makes the transition from exploratory, interpretative research to 'a problem-solving practice that involves collaborating with research participants to bring about some form of change' (2009a: 11–12). Pink notes that the proliferation of images in social research received a barrage of criticism on the grounds that they impinge on the objectivity, authenticity, and generalisability of findings (2007: 9). Responding to these accusations, Pink differentiates between images that document and supplement fieldwork illustratively, and those which actively participate and innovate (2007: 94). Visual social scientists Andrew Loxley and Jon Prosser adopt a similar perspective and go some way to rationalise 'researcher created images' as legitimate research tools (2008: 9). Through photography, drawing, and other image-making techniques, the researcher externalises abstract and literal experiences, hunches, and hypotheses and begins to connect their subjective knowledge to their perceptions of the research subjects.

Pupil Response Record – Interactive Whiteboards

Name: GIRL
Age: 10

Working with Interactive Whiteboards in class...

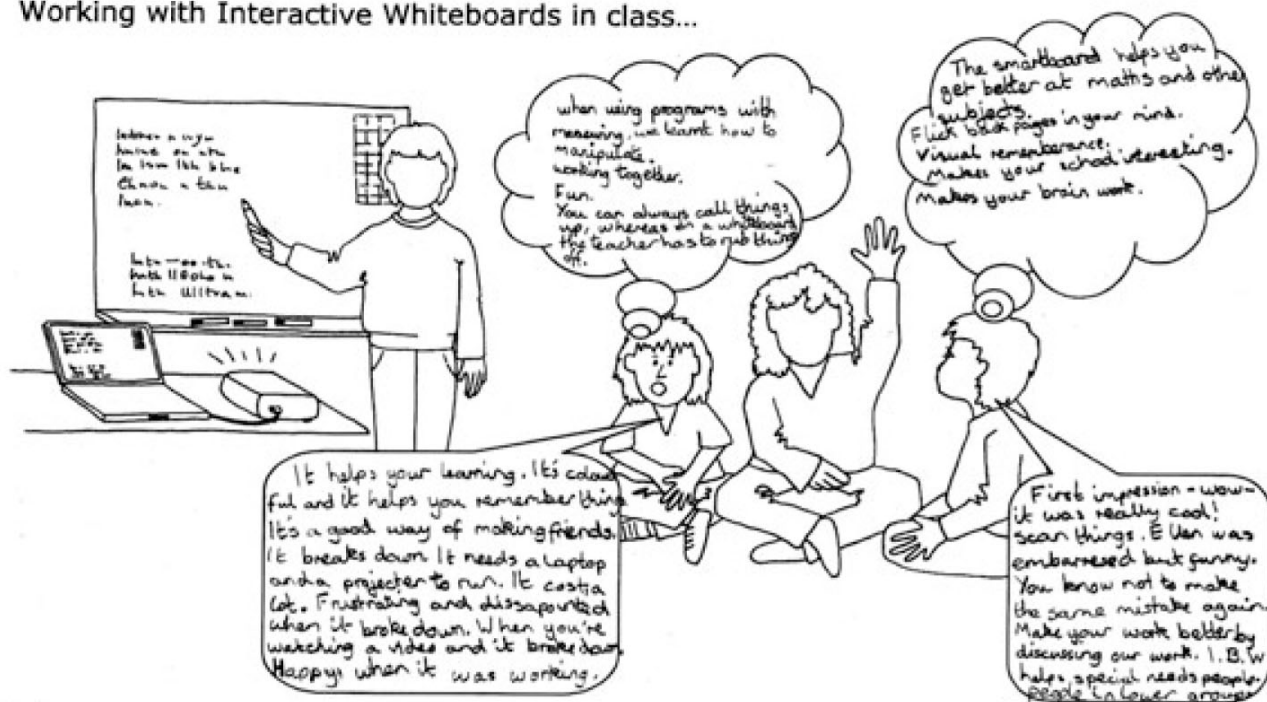


Fig. 14. Kate Wall, Steve Higgins, and Heather Smith (2005) Example of template used to collect pupil views [drawing]

These visual methods are later complemented by the production and analysis of 'respondent generated visual data' (Loxley and Prosser, 2008: 17). As Loxley and Prosser evaluate, educational researchers Kate Wall, Steve Higgins, and Heather Smith (2005) investigated the use of interactive whiteboards through a 'researcher created template' comprising drawings of teachers, pupils, and other paraphernalia associated with the classroom environment (Wall et al., 2005; Loxley and Prosser, 2008; Fig. 14). Reminiscent of the composition and application of Macdonald et al.'s playmobil scenarios (2010), by inviting pupil participants to complete the template's blank areas and empty speech and thought bubbles, the researchers were able to extrapolate connections between the exterior reality of the educational setting and the pupils' interior feelings (Wall et al., 2005: 854).

Applying these ideas to my research question and aims, the permeation of visual and participatory methods in human-centred design reflects anthropological photographer Elizabeth Edwards' conceptions of a 'material turn', after which it became desirable to draw from humans' naturalistic encounters with material objects to develop corresponding theories of social practice (2002: 69–70). In 'Reassembling the Social: An Introduction to Actor-Network Theory' (2005), sociologist Bruno Latour asserts that human and non-human actants never operate alone, but are bound by their relations to each other. Intermediaries transport meaning yet are not altered in any way themselves, while mediators 'transform, translate, distort and modify' meanings as part of their role within the network (2005: 38–39). As Martha Feldman and Wanda Orlikowski underline, such sociomateriality has been posited as a lens for viewing and interpreting complex phenomena in the fields of organisational studies and management research (2011). People and artefacts are thought of as mutually informing, intrinsically conjoined, and able to evoke knowledge through their daily practices:

A sociomaterial perspective would highlight how synthetic worlds are not neutral or determinate platforms through which distributed collaboration is facilitated or constrained, but integrally and materially part of constituting that phenomenon.

Following Latour's views, Orlikowski maintains that the omission of materiality from organisational theories is incongruent with the omnipresence of technological artefacts in everyday life (2010: 5). Drawing from technological anthropologist Lucy Suchman's writings on sociomateriality as an entanglement of people and artefacts (2007), Orlikowski asserts the emergence of a relational ontology, in which agency is distributed between humans and non-humans. Such views contend that social processes and artefacts are co-constructed historically and institutionally (Orlikowski, 2010: 8, 12).

Exemplifying sociomaterial designerly collaboration, architectural researchers Boris Ewenstein and Jennifer Whyte (2009) borrow from sociologist Karin Knorr Cetina's writings on 'epistemic objects' (2001) to observe how a team of architects' drawings are used to communicate design requirements. The epistemic object's abilities to ask questions, to be incomplete, unstable and adaptable, and to elicit knowledge are key to their investigation, and the authors comment on the sensoriality achieved when images and artefacts are involved in tactile design conversations. The graphic spatial composition of their initial sketches probes and provokes the architects to point out functional or aesthetic flaws:

Design here takes the shape of exploration or inquiry. The drawing is an active participant in a process of exploratory, projective reflection. It does not simply depict or represent the previous reflections of the designer or designers. Thus the important role visual representations play as knowledge objects is not just on account of their capacity to embed or inscribe knowledge. Inscribing, embedding and containing is only part of the story; the other is lacking, wanting and unfolding in uncharted directions.

Ewenstein and Whyte, 2009: 22

Obscuring the epistemic sketch with tracing paper and using marker pens to correct and refine their design solutions, the team's insights and expertise are exhibited in this reappropriated drawing. Deemed a 'technical object', its layers, annotations, and reworkings chart the development of the architects' collective and critical decision-making practice (Ewenstein and Whyte, 2009: 22–24).

These sociomaterial conceptions of epistemic objects thus have clear links to the mediatory material entities found in ANT, but also adhere to the practical and evocative placement of images as methodological tools and techniques in visual anthropology. While I will return to these perspectives in chapter two to critique their resonance with my own practice and methodology, sociomateriality is useful in conceptualising human-centred design relationships as an assemblage of creative and communal activities.

Participants and things: a question of designerly agency

Seeking to mirror the acceptance of the researcher's images as methodological devices, I draw inspiration from Pink's discussions of a 'reflexive turn' in visual and sensory anthropology. In the mid-1980s, cultural and social anthropologists gave credence to the dialogic process by which ethnographic texts are constructed and the importance of integrating participants' voices into academic representations (Pink, 2009b). The researcher's input and impact negotiates a way of discovering 'not only the ideas of others, but in learning about their understandings through her or his own physical and sensorial experiences' (Pink, 2009b: 14). Pink puts forward 'sensory intersubjectivity' as a convergent accumulation of individual human experiences, harnessed subjectively through immersion in the research process (2009b: 53–54). The researcher's positionality and reflexivity are defined by ethnographer Charlotte Aull Davies:

In its most transparent guise, reflexivity expresses researchers' awareness of their necessary connection to the research situation and hence their effects upon it, what is sometimes called reactivity. This has often been conceived in terms of the subjectivity of the researcher, with attempts being made, especially from a positivist orientation, to ensure objectivity.

Davies, 2008: 7

Transposing these notions of subjectivity, authorship, and self-reference in social research to human-centred design apprehends the designer's unstable position as a creator, facilitator, and interpreter of visual and participatory tools and techniques. From my evaluation of the toolkits, it is apparent that creativity, expression, and exploration are sought primarily from users and stakeholders as interpretative evidence of their interior emotions and needs (Aldersey-Williams et al., 1999; IDEO, 2002; Tassi, 2009; Hanington and Martin, 2012; The Design Council, 2013; Helen Hamlyn Centre for Design, 2013; HCD Connect, 2013). This assumption contributes to altering perceptions of the designer as a creative auteur to a facilitator of the ideas of others (Burns et al., 2006: 26; Inns, 2010: 24–26). Indeed, the expansion of human-centred practices in design has been met with a degree of suspicion by both the public and the profession at large:

We used to know what designers did. They understood the relationships between form and function, aesthetics and usefulness. And they produced stuff. People who do something rather different are now being hailed as the coming thing. The new stars of design work on rather nebulous, intangible things such as services and business models. They collaborate, so it's difficult to see where their authorship begins and ends. And their arrival has caused toxic shock to the design world, resulting in an awful lot of bad feeling.

Bedell, 2005

In critiquing the advent of transformation design, Bedell interrogates the diversification of designers from expert visualisers and producers to 'organisational impresarios, or design catalysts' (Bedell, 2005; Burns et al., 2006). Many attempts have been made to demystify the human-centred designer's role and responsibilities (Inns, 2010: 24–26). Tom Kelley examines roles from a design-led innovation perspective and presents ten personas for designers to assume: anthropologist, experimenter, cross-pollinator, hurdler, collaborator, director, experience architect, set designer, caregiver, and storyteller (2008). Structuring and directing participatory and collaborative activities with users and stakeholders, the facilitator role has received much attention. Guy Julier maintains that

facilitators provide neutral and objective support for clients as "trainers" rather than "players" (Julier, 2007: 208). Similarly, design researchers Nicola Morelli and Ezio Manzini independently stress the designer's position as a social connector and agent of change (Morelli, 2007: 18; Manzini, 2009: 11). These definitions are shared by designers Kin Wai Michael Siu (2003), John Thackara (2006), Daniel Christian Wahl and Seaton Baxter (2008), Eckert et al. (2010), and Jacob Buur and Henry Larsen (2010). Recently, design researcher Lauren Tan published a PhD thesis positioning the designer as a co-creator, researcher, facilitator, capacity builder, social entrepreneur, provocateur, and strategist (2012). Despite Tan's background as a graphic designer, she does not, however, explicate the implications of visual tools and techniques on designers' roles. Evoking Brown's foregrounding of the non-designer and my misgivings surrounding Burns' design masterclass, as a coordinator and facilitator in these user autonomous processes, the designer is conceived of having less authority and control as a creative maker (Siu, 2003; Bedell, 2005; Morelli, 2007; Brown, 2009; Burns, 2011).

When images and artefacts are incorporated as methodological tools and techniques, the aesthetic tone of their two-dimensional surfaces tend to be either glossed over or consciously rejected as the designer endeavours to remain focused on participants' experiences, needs, problems, and aspirations. In promoting design thinking in organisational settings, Brown stresses that visual thinking techniques afford consensual dialogue between designers, users, and stakeholders, but at the same time, proclaims that aesthetic style and artistry are best avoided (2009: 13, 80–81). I believe this neglect is rooted in design's 'intractable rationalist paradigm', addressed by architectural researcher Kathryn Moore in her study of visual perception and design pedagogy (2010: 6). Moore argues that design's general refutation of subjective expression is symptomatic of its refusal to embrace a relational view of practice-led activities and concepts. The designer's creative abilities inform how data is collected, analysed, and disseminated. Methods are not visual by default to illustrate the journey, but participate in uncovering knowledge throughout the process (Pink, 2007). Recalling Alexander's suspicions of rationality in conventional design methods,

a failure to appreciate the knowledge emerging from designers', users', and stakeholders' interactions via visual and participatory methods presents an incomplete taxonomy of design, blocked by a futile search for scientific objectivity (Mitchell, 1993: 51; Moore, 2010: 7).

Desires to rationalise design have overshadowed the practitioner's skill and agency, and as Kees Dorst substantiates, the discipline's preoccupation with understanding processes and methods disregards the individual designer's ability to negotiate complexity in diverse sociocultural settings (2008: 5, 8). While user and stakeholder participation is indeed critical, I attest that human-centred design has yet to fully interrogate the multifaceted designer's impact in and on the process. Building on the recognition of reflexivity in ethnographic research, in which the researcher is actively involved in the societies and cultures that they study (Davies, 2008; Pink, 2009b), I propose that the human-centred designer's reflexive engagement with visual and participatory methods can render the process' abstract, emotional qualities tangible, reportable, and accessible to a wide range of participants, collaborators, and audiences. Confusions over the designer's role as both a practitioner and analyst are interrogated by Steen, who professes that designerly reflexivity fosters clarity, focus, and accountability in the human-centred design process:

I present HCD [human-centred design] as fragile: I think that it can be beautiful and that it can break easily. Furthermore, I recommend that practitioners bear this in mind when they organize or conduct HCD. I recommend reflexive practice as a way for practitioners to be (more) aware of and (more) articulate about their own role and agency in their HCD practices. This would help practitioners to align their practice more closely with their intentions and with what HCD can be about.

Steen, 2008: 17

I too view reflexivity 'not as a bug, but as a feature', and respond to the relative neglect of the human-centred designer's visual practice as a technique for stimulating dialogue (Steen, 2008: 71). Industrial design researchers Paul

Hekkert and Matthijs van Dijk concur that an increased emphasis on participant engagement displaces and erodes the designer's creative expertise (Hekkert and van Dijk, 2001; Steen, 2012: 14). Offering reflexivity as a mechanism for designers to manage human relations and augment participatory sessions, technological researcher Randi Markussen insists that 'in speaking in your own voice you also allow others to do the same. I think that the cooperative design approach is solid enough to speak not in the voices of users and their needs, but that we may further develop our own voices and learn to speak for ourselves' (1994: 65). These perspectives correspond with Steen's two tensions arising from human-centred design: the decisions that designers must make when balancing participants' responses with their personal expert knowledge and intuition, and their aims to understand contexts as they currently exist, with the goal to inspire innovative change. Steen poses reflexivity as a means of mediating these discrepancies and engaging in mindful and socially inclusive design practice (2011: 46–48). Working from the Scandinavian participatory design tradition, Bødker identifies that methods and processes have proliferated design practice to the extent that they are employed without sufficient reason or reflection on the designer's part (2006). In response, she proposes a specific design-led comprehension of reflexivity that incorporates and applies artistic statements as participatory strategies (Bødker, 2006: 5–6). As Steen concurs, reflexivity cannot be put forward by 'simply recommending people to be reflexive', but by posing questions, stimulating thought, and envisaging patterns of behaviour (2012: 14).

Seminal practice-led researcher Donald Schön's concept of 'reflection-in-action' pertains to this discussion (1983). A recognition that 'indeterminate zones of practice' are inherent in the sociocultural dynamic of design indicates that the designer's routine application of skills becomes more specialised when unexpected events take place. Therefore, when designers, users, and stakeholders interact in culturally specific ways, the designer is challenged to convert experiential hunches into practical strategies (Schön, 1985: 25). Design researcher Nigel Cross develops Schön's theories to dispute the homogenisation of design as a discipline (2001). Defending the designer's methodological intuition

to identify and solve problems, Cross categorises design knowledge into three branches. Two of these can be understood simplistically as the insights the designer gains from using existing artefacts and making new artefacts. Prior to the acquisition of this knowledge is the reflective act of process-led thinking core to all design activity (Cross, 2001: 54–55).

Expanding on cognitive processes and visual skills, Cross explains that sketches and diagrams at once externalise the designer's understandings of the design problem and enhance how they communicate and collaborate with others. This stresses the pivotal role of visualisation and making skills in the design process beyond representing the expected form and function of products. Cross' insights are therefore transferable to human-centred fields (2006: 11, 19). Hanington equates the visual properties of innovative methods to the fact that designers 'are fundamentally involved in creative, visual activity, and the research methods they use should provide corresponding opportunities' (2003: 15). Methods devised with a conscious visual and material dimension can result in a tangible dialogue through which complex issues are unpacked (Burns et al., 2006: 18).

In spite of this, the surrounding literature and the toolkits' prescriptive recommendations evidence a disregard or a concealing of the designer's expertise as a visual maker and intuitive interpreter. Mattelmäki has partially countered such shortcomings by confirming that the probes' inherently visual and material character supports the designer's aesthetic sensibilities and provides opportunities to utilise self-expression to provoke participants' responses (2006). Furthermore, Lee et al. concede that the process of designing tools directed their students' collaboration during the project's early stages (2011). Acts of making encouraged them to be sensitive and empathic to participants' reactions and allowed the design team to recall their subjective experiences and imagine themselves as the recipients of their own tools (Lee et al., 2011: 108). These insights inform my investigation of the designer's tools and techniques and the emotive qualities of images and artefacts that can establish, manage, and sustain human-centred design relationships.

While visual and participatory methods are deemed capable of gathering practical data and influencing the social nature of human-centred design processes, designers must demonstrate self-awareness and make decisions based on their expertise and knowledge, as well as the users' and stakeholders' perspectives (Steen, 2011: 47). By informally meeting with user samples prior to introducing their probes, for instance, the students in Lee et al.'s study gained an understanding of participants' personalities and adjusted the designed tools accordingly. When the students engaged with school pupil participants on a personal level during a participatory workshop, further empathic and experiential insights supplemented their tools' collection of written and drawn annotations. These third space sequences of events opened up verbal exchanges, uniting designers and participants through reciprocal dialogue where experiences and aspirations were shared democratically. This, in turn, offered a reflexive strategy for the students to cope with the difficulties of navigating methods, participants, processes, and outcomes (Muller and Druin, 2012; Lee et al., 2011: 109–110).

The ideas discussed in this chapter point towards a multitude of roles for the designer, accompanied by an array of potential tools and techniques at their disposal. With reference to the central research aim, visual and participatory methods are traditionally used by human-centred designers to elicit information by progressing participatory acts of insight gathering, idea generating, and decision making, and to encourage understanding, empathy, rapport, consensus, and dialogue in the relationships they form with users and stakeholders. Nevertheless, and affirming the research question's focus, little attempt has been made to examine human-centred designers' specific methodological practices of making, using, and interpreting visual and participatory tools and techniques, and the consequent implications these have on the direction of the process, their interactions with participants, and their own roles as practitioners and researchers. Integrating creative and communal activities and underdeveloped notions of reflexivity in human-centred design, in the following chapter I set out a five-stage participatory-reflexive methodology, through which I translate my own subjective experiences of the design context into tools and techniques to engage with participants and analyse our interactions.

TWO

Crafting a participatory-reflexive methodological compass: positions, cases, practice, and stages

In this chapter I detail the methods that support my navigation through the human-centred design process. Discussing the development of design research, I establish my methodology's constructivist philosophical stance underpinned by concepts of participatory design and reflexivity. I then explain how the multiple case study method allows for submethods to be created, applied, and evaluated, and for comparisons to be made between settings, participant groups, and emergent sociocultural insights. The case studies are central to my five-stage participatory-reflexive methodological compass. Visualised in the diagram presented in Fig. 15, this contains complementary visual and participatory tools and techniques for data collection and analysis.

In the orientation stage I use secondary desk research, participant observation, and an experiential form of drawing to investigate the issues surrounding each case study setting. I then create interactive images and artefacts in the participation stage to collect participants' qualitative experiences in community consultation sessions, participatory workshops, and materially mediated interviews. Developing Burns' strategy for organising observations (2011), I categorise their responses in the evaluation-in-action stage and communicate identified problems, opportunities, insights, needs, and themes by making large format illustrative maps, matrices and transcripts. These go on to inform the interventions I propose as storyboards, scenarios, and prototypes.

The fourth and fifth methodological stages comprise tool response analysis to ascertain prevalent concepts from participants' writings, drawings, and speech, and a reflexive analysis of case study narratives and the sociomaterial interactions that take place in human-centred design exploration. In accordance with the

research question and aims, my subsequent layering of analytical findings examines the impact of reflexively expressing my own subjectivity through my illustration and design practice in three defined sociocultural settings, and my tools' and techniques' parallel abilities to elicit information and advance the process whilst stimulating understanding, empathy, rapport, consensus, and dialogue in human-centred design relationships.

Philosophically underpinning the participatory-reflexive methodology

Margolin and Cross chart the early years of design research and acknowledge the initial objectives of Archer (1963), Alexander (1964), Simon (1969), and Jones (1970) to mirror the objectivity and rationality of scientific research (Margolin, 1998: 43; Cross, 2001: 49). Reconfiguring induction, where theories are generated directly from the researcher's experiences and empiric observations, scientific philosopher Karl Popper disputes the epistemological value of singular statements and their tendency to be considered generalised truths (1959: 4). Maintaining that the route to new knowledge lies in the process of disproving existing theories, Popper's development of the 'Hypothetico-deductive' model contributed to upholding the positivist paradigm's objectivist epistemological vision of the researcher as distant and detached from the field (1959: 9). This system of relational deduction correlates general theories with specific circumstances to produce a rational explanation of events (Popper, 1959: 25). Yet through developing his theories of deduction, Popper conceded that absolute objectivity is an unrealistic expectation in scientific research, subscribing to the view that knowledge is intersubjectively negotiated (1959: 25).

As I touch upon in the last chapter, designers were to move away from positivist ideals as predicating an unattainable and, moreover, undesirable realist ontology in which reality, truth, and knowledge are thought to pre-exist the investigation (Mitchell, 1993; Moore, 2010). Evoking the distinguishing features of design and ethnographic research, Simon would later concede that design both examines and explains the world as it is, before actively identifying problems and posing solutions (Simon, 1996: 114; Hanington, 2003: 14; Battarbee, 2006: 66; Halse, 2008: 22). To compile a rich anthology of theoretical knowledge to match its thriving practical status, designers are advised to embrace interdisciplinary methods that correspond to the contexts of inquiry and the established epistemology of design research (Margolin, 1998: 47; Cross, 2001: 55). Design researchers Julka Almquist and Julia Lupton concur with this view, and equate the pervasiveness of social scientific in human-centred design to the user's prominence (2010: 3).

Following these ideas, Fulton Suri (2007) stresses a methodological shift when designing for people (as in traditional product design practices), with people (through participatory stages), and by people (in co-design activities). The users' integration is progressively linked to how their needs are inferred, translated and, ideally, self-recognised (Fulton Suri, 2007). Anticipating the need to involve the 'entire community that is engaged with design' in the process, my investigation places intersubjective importance on 'an interpretive practice, rooted firmly in the techniques of the humanities and social sciences rather than the natural sciences' (Margolin, 1998: 47).

In my earlier discussions of human-centred design relationships, I appropriate Latour's human and non-human actants and the agency that each embody and attain through their placement in socially situated networks (2005: 38–39). ANT, however, is aligned with epistemological objectivity, and thus, explicitly positions the researcher 'one reflexive loop *behind* those they study' (emphasis in original) (2005: 32–33). Originating from a positivist view of society and extending ANT as a scientific method to describe sociomaterial connections, Latour voices his criticisms of interpretative sociologists:

They would say that *human* desires, *human* meanings, *human* intentions, etc., introduce some "interpretive flexibility" into a world of inflexible objects, of "pure causal relations", of "strictly material connections". That's not at all what I'm saying. I would say that this computer here on my desk, this screen, this keyboard are objects made of multiple layers, exactly as much as you sitting here are: your body, your language, your worries. It's the object itself that adds multiplicity, or rather the thing, the "gathering".

Latour, 2005: 144 (emphasis in original)

Subjectivist interpretations and explanations pertaining to reflexivity are deemed problematic by Latour, intensifying his view that favouring people over artefacts imbues the researcher with a predetermined bias that muddies the search for material agency in interwoven social relationships (2005: 33, 144). Latour

contends that ANT does not posit 'an absurd symmetry between humans and non-humans', and while these actants are different, they are not mutually exclusive (2005: 76). Conceiving an object-oriented philosophy, whereby material entities exist both autonomously and relationally, philosopher Graham Harman cites Latour as 'the ideal object-oriented hero', but critiques his assessments as being too polarised (2009: 156). To develop these notions of speculative realism, Ian Bogost considers the humanising of artefacts an 'alien phenomenology' and advances an object-oriented ontology that effectively decentres human existence (2012: 5, 34).

These views deflect from human-centred design's inherent focus on people, and from their prevailing relations with things, as characterised by participatory design. Reacting against the scientific rationality of the positivist stance, Ehn was pivotal in expounding participatory design's democratic human-centred values (1989; 1993). Drawing from Ludwig Wittgenstein's conceptions of social rules being understood and adhered to through the consensual acceptance of 'language-games' (1953), insights are negotiated intersubjectively by designers and participants, constructed and reconstructed through the research and design process, and made material and tangible through their interactions with visual and participatory methods (Ehn, 1989: 27; 1993: 64–65; Sanders et al., 2010: 2). Lucy Kimbell interrogates the proliferation of design thinking and professes that disciplinary definitions are often contradictory to the extent that 'research about design has seen understandings of design shift away from objects towards the social, but it is not clear where this idea of the social is located' (2009: 5–6). Yet as Kimbell continues, the integration of designerly practice in communal activities with non-designers aims to generate inclusive and innovative ideas. This positions exploratory human-centred design as an intrinsically social process (Kimbell, 2009: 7; Björgvinsson et al., 2012: 101).

Sociologist Erving Goffman's studies of symbolic public interactions (1963) help frame human-centred design relationships as socially situated, intersubjectively constructed gatherings. These affiliate designers and participants into situations where messages are sent and received linguistically and expressively (1963: 16). Goffman's unfocused interactions (intuitive, sensorial communication) and

focused interactions (deliberate, typically verbal communication) resonate with the designer's practice of observing users in their natural environments, and initiating participants in workshop settings (1963: 24). Social interactions are understood as face engagements constituting a series of mutual activities that are symbolised by verbal and non-verbal exchanges (Goffman, 1963: 89–90). Goffman alludes to the researcher's reflexivity as a regulation that 'governs a person's handling of himself and others during, and by virtue of, his immediate physical presence among them' (1963: 8). As such, I appropriate my design practice to observe, document, describe, analyse, and reinterpret human-centred design interactions.

Encapsulating how designers create and subsequently perceive practice, my reflexive stance evokes sociologist Pierre Bourdieu's concepts of culturally prescribed values as the 'habitus' (1989: 131). This mediates conceptions of society as a collection of human entities and as an external set of structures which they are organised by. The habitus thus conceives humans as being shaped by their social status and subjective experiences, and interrogates how these values perpetuate social practices and are reproduced by others as 'an acquired system of generative schemes objectively adjusted to the particular conditions in which it is constituted' (Bourdieu, 1977: 95). Davide Nicolini and Theodore Schatzki point out that theories of practice configure social life as an 'organised constellation' of individuals' collective activities, comprising conscious and purposeful actions, and situated amongst the time and space of everyday life as a 'dispersed nexus of doings and sayings' (Nicolini, 2009: 1392; Schatzki, 2012: 1–2). The interdependency of entities in social practices is conceptualised as 'practice-arrangement bundles', where arrangements structure and facilitate practices, and practices customise and contextualise these arrangements. Schatzki goes on to explain that bundles typically unfold as practices develop in response to corresponding social phenomena and thus, bundles prefigure innovation (2012: 2–5).

Sociological design theorists Elizabeth Shove, Matt Watson, and Jack Ingram affiliate practice theory and design research as sharing the view that social

meanings are mediated by the creation and use of material objects (2007). Examining the consumption of products to postulate how 'artefacts and practices co-evolve', the authors explain that the design or scripting of an object dictates how it is used and the symbolic connotations it accrues (Shove et al., 2007: 5). Such ideas are upheld by technological researcher Peter-Paul Verbeek's assertion that when images and artefacts participate in practices, they influence the nature of the objective design setting and the subjective knowledges of designers, users, and stakeholders (2005: 171).

The joint agency of people and things afforded by sociomaterial practices provides a means of conceptualising creative and communal activities in human-centred design relationships (Orlikowski, 2005; 2010; Orlikowski and Feldman, 2011). However, Ehn concedes that 'participation in the making of such things stands out as the ultimate challenge for professional design', and simultaneously begs the question of the designer's role in increasingly human-centred contexts (2008: 99). Foregrounding the human-centred designer's visual and material practices as drivers of data collection and analysis, I devise visual and participatory methods in response to my subjective perceptions and sensory experiences.

My subjective epistemological approach draws from John Dewey's pragmatic concepts of experiential knowledge and Michael Polanyi's anti-positivist theories of tacit knowledge (Dewey, 1934; Polanyi, 1958). Correlating everyday encounters and aesthetic making, artistic researcher Estelle Barrett attributes knowledge creation to a fundamentally social practice (2007: 118). Just as the skilled practitioner's routinised responses, or knowing-in-action, can be interrupted by unexpected occurrences, the designer's critical artistry interprets, adjusts, refines, and progresses the process in reaction to the serendipitous information that is revealed (Schön, 1985: 28; Cross, 2001: 53–54). Suggesting ways to address Steen's tensions of managing subjectivity and participants' needs in human-centred design, externalising tacit knowledge can communicate the researcher's experiences and make discoveries that are applicable to wider audiences (Steen, 2011: 46–48; Barrett, 2007: 119).

I seek to bridge the designer's reflexive self-understandings and their engagement with others through the integration of methodological images and artefacts. Critiquing semiotic analysis in design as subsuming an objective baseline of signified meaning, Klaus Krippendorff defines constructivism as a participatory act of understanding, 'arising within the circular process of perception and action or of conceiving and making things, in other words, in practice or in social practice when other humans are as well involved' (1992: 25–26). Framed by social scientists Yvonna Lincoln and Egon Guba as a permutation of interpretivism, the constructivist paradigm is structured by a relativist ontology: the presumption that entities exist only in the minds of the people who perceive them (2013). A corresponding subjectivist epistemology conceives that knowledge is co-constructed through the researcher's relationship with the research context, and accounts for the idiosyncratic nature of both. Applying constructivist principles to my research, these philosophical foundations promote a methodology that is capable of harnessing the multiple senses and meanings of designers and participants via their relational interactions with visual and participatory tools and techniques (Lincoln and Guba, 2013: 39–41).

My practice and my methodology are intertwined and interlinked. In their extensive evaluations of practice-led creative research, Carole Gray and Julian Malins deem methodology a vehicle chosen in response to the terrain, that drives the research process and transports the researcher's individual methods (2004: 15, 17). This cements constructivism's hermeneutic and dialectic methodological objectives to advance the mutual negotiation and co-construction of knowledge (Lincoln and Guba, 2013: 40–41). Defining practice as a generative, creative activity and a collaborative interdisciplinary construct, Gray and Malins go on to assimilate practice-led researchers in their various roles, implicating the subjective position of the human-centred designer and affirming that the knowledge produced is 'intersubjective, context bound, and is a result of personal construction' (Gray and Malins, 2004: 21, 104). My position alternates from observer, to maker, to facilitator, to analyst. I therefore utilise my tacit skills and experiential knowledge as a designer, illustrator, researcher, and PhD student to respond methodologically

to the case studies I am immersed in. My practice is at once visual and creative, descriptive and interpretative, and involves distinct periods of individual reflection and analysis, participatory discussion, and co-evaluation.

Describing a case for the case studies

My developing methodological framework concurs with Michael Biggs' views of the case study as bridging design practice and research, which, as design researchers Maggie Breslin and Richard Buchanan advocate, applies learning through human-centred design practice in education towards 'implementing decisions in a murky world' (Biggs, 2004: 20; Breslin and Buchanan, 2008: 37). The case study method allows researchers to identify a specific individual, group, institution, event, activity, or object that has a theoretical, methodological, conceptual, or practice-based congruity with their investigation. Explicating its value, psychologist Robert Yin (1994) confirms the case study's promotion of rigorous data collection from multiple sources. In data analysis, thematic strands of information form a 'chain of evidence' to guide readers through the overall research procedure (1994: 90–101). The single case study thus accommodates a discrete project in which to explore and test propositions. Its focus is on both the phenomenon identified by the research questions and aims, and the geographic and social setting in which this is observed. This interwoven example of phenomenon and setting mediates a flexible and descriptive, yet systematic and explanatory approach to data collection and analysis (Yin, 1994: 3, 13).

As qualitative social scientist Bill Gillham points out, to arrive at a robust set of conclusions, researchers must be mindful of discrepant data and contradictions between sources (2000: 13, 29). Within the case study, Yin builds on evaluation consultant Michael Quinn Patton's recommendations (1987) that research findings be treated to three or more validation procedures through distinct variations of triangulation. Data triangulation collates information from a variety of sources, investigator triangulation seeks different researchers' evaluations on

the same phenomenon, theory triangulation utilises a series of distinct theoretical frameworks, and methodological triangulation investigates the phenomenon using complementary sets of tools and techniques. When subjected to these corroborative measures, findings are deemed more accurate and rigorous (Yin, 1994: 91).

Exemplified by The Design Council's development and application of the Double Diamond in various commercial settings, the human-centred design case study can be thought of as responding to the experiences, needs, problems, and aspirations of users and stakeholders in the sociocultural setting, before analysing and evaluating local findings in relation to established research in the discipline (The Design Council, 2007b). Stressing the benefits of the artistic case study in public settings, Biggs notes that 'artistic enquiry is not just artistic enquiry about the nature of the physical world but is also artistic enquiry about the artistic world' (2004: 9). Barrett asserts that practice-led researchers accumulate knowledge through their naturalistic, everyday encounters, and their sensory and aesthetic interactions with artistic materials (2007). Building on concepts of experiential knowledge and the role of the artefact in practice-led research, Biggs deconstructs this iterative interplay of research field and research context and values generalisations derived from artists' and designers' experiences of practice (2007: 184). This extrapolation of findings has parallels with Breslin and Buchanan's belief that innovation is not the outcome of an elusive eureka moment. Instead, they encourage design researchers to carefully and critically evaluate their practice in order for 'universal ideas to be extracted' (Breslin and Buchanan, 2008: 38).

In chapter three, I adopt a 'dialectical conversational approach' to describe how I carry out each case study (Breslin and Buchanan, 2008: 39). These multiple case study accounts are grounded in my local objectives to engage user and stakeholder participants from Rothesay, Islay, and the Mackintosh Building in exploratory human-centred design processes, and to use visual and participatory tools and techniques to gather and evaluate their perceptions of these settings. As a form of methodological triangulation, I focus on one of three stages of

data collection in each case study (Yin, 1994). My subsequent analyses and comparative evaluations in chapters four and five allow me to correlate and contrast emergent sociocultural insights. Moreover, the multiple case studies support my assessments of relationships and roles with respect to the specific aspects and attributes of my corresponding methodological tools and techniques.

I exercise a reflexive decision-making strategy when designing appropriate submethods to mediate the gap between questions and knowledge (Biggs, 2004: 20). The diagram I present in Fig. 15 positions the three case studies at the centre of my five-stage participatory-reflexive methodological compass. Structuring my systematic navigation of the case study settings, the compass' concentric circles and five extended branches organise the visual and participatory tools and techniques comprising each stage. Gray and Malins deem methods such as observation, drawing, and interviews 'specific techniques and tools for exploring, gathering and analysing information' (2004: 17). Due to their visual and material nature and their facilitation with user and stakeholder participants, I deconstruct Gray and Malins' definition to account for the circles within the branches as the techniques I use to collect, synthesise, and evaluate data, while the rectangles represent the tools that arise from these acts of making, using, and interpreting. I detail their particular conceptual, visual, and practical qualities in chapters three, four, and five, but in this chapter I go on to provide an overview of the methodological stages that they belong to. I classify these as tools and techniques for orientation, participation, evaluation-in-action as stages of data collection, and tool response analysis and reflexive analysis.

Tools and techniques for orientation

I begin orientation in the case studies by seeking an overview of the sociocultural settings in their existing states. I use internet and library catalogue searches to divergently map local issues and investigate related users and stakeholders who may be suitable participants in later stages. Hanington and Martin stress that although often time consuming, secondary research provides a low cost means of 'establishing definitional boundaries of the design project' which recognises precedents, suggests user demographics, and negotiates the designer's understandings of the site remotely (2012: 154). This technique helps me locate culturally specific experiences, needs, problems, and aspirations and identify any existing initiatives that have addressed such issues. Distinguishing between subsequent phases of immersion in the field and designerly creation, I refer to this technique as desk research. In turn, I create illustrative sketchbook maps and displays on the studio walls to visually organise emergent information.

Whilst demonstrating a critical awareness of human interactions within each case study setting, I then undertake a phase of participant observation to gain an empathic insight into living and working in these environments (IDEO, 2002; Kelley, 2008; Hanington and Martin, 2012: 124–125). I document my observations through sketching, snapshot digital photography, and making written fieldnotes, resulting in a series of visual outputs that describe my initial encounters. Designer Gabriela Goldschmidt maintains that sketching techniques promote the designer's own construction of the design problem and surface their 'innermost, tacit, otherwise untapped knowledge, biases, concerns, and preferences' (2003: 79, 86–87). By incorporating traditional document-based data collection and artistic visual techniques, I externalise my findings into what Goldschmidt calls the 'self-generated display'. Encompassing handwritten text, sketches, and diagrams, these tools provide descriptive narrative accounts of participant observation. As an *aide-mémoire*, they function as tangible repositories for layers of data in an otherwise complex stage of design exploration (Cross, 2006: 11, 19).

I then engage in a period of studio-based reflection and intuitively select drawing materials and techniques to consolidate my subjective responses to each setting. Suggesting that broad conceptions of drawing have resulted in its marginalisation by traditional design practices, designer Steven Garner confirms that drawing addresses both problem solving and problem finding (1992: 98). Following the premises of design and ethnography I have already discussed, expressive and experimental reflection allows designers to interrogate what currently exists, while the drawings function as tools to interpret what may exist after the designer's intervention (Garner, 1992: 104; Simon, 1996: 114; Battarbee, 2006: 66; Halse, 2008: 22). Drawing researcher Terry Rosenberg critiques the practice of product designer John Rhys Newman, emphasising his 'ideational drawings' as combining the physicality of the external design environment with the designer's innovative imaginings (2008). In Fig. 16, Newman uses linear and tonal drawing techniques and subverts aspects of scale to juxtapose the objects he encounters whilst working at his desk. This mode of visual reasoning suggests that the human-centred designer's preferred compositional devices and stylistic techniques can enrich exploration and reflection in the early stages of the process.

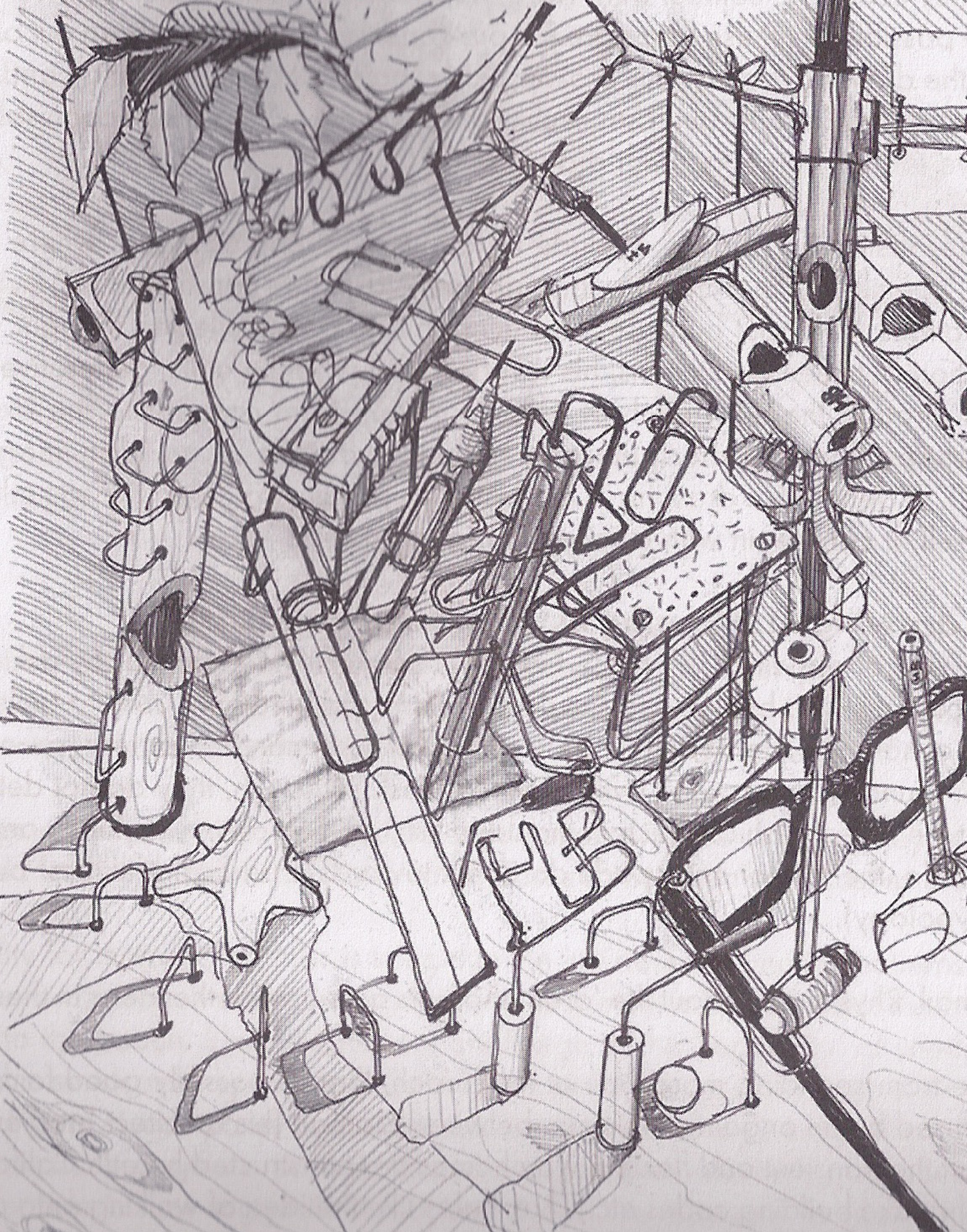


Fig. 16. John Rhys Newman (2006) *Untitled drawing* [drawing]

Newman's practice incorporates observation and visual perception, but moves beyond these a 'space of play' for idea generating (Rosenberg, 2008: 120). Ideational drawing pertains to my dual appropriation of participant engagement and designerly reflexivity. It attends to both the creation and use of drawings as 'not a space in which thought is represented but rather a space where thinking is presenced' (Rosenberg, 2008: 109). Assessing visual practice in architectural research, design anthropologist Wendy Gunn affirms that making images conveys experiential stories and charts the designer's developing knowledge:

Through getting to know a site the architect is reminded of a particular instance, landscape, feature or memory of engagements with other people. Memories of a site endure long after the memory of its architecture fades. These memories provide guidance throughout the design and building process in a way that is not so much about physical orientation as about value judgements.

Gunn, 2007: 116

Encompassing Gunn's distinctions of physical and emotional orientation in the design setting and Barrett's debates surrounding practice-led experiential knowledge (2007), studio-based reflection informs my production of experiential drawings. Imbued with my own artistic style, these images at once visualise my perceptions as an outsider, examine my insights surrounding observed events, and assume the form of scenarios, personas, and storyboards: methods that are typically useful in generative design phases and activities (Macdonald et al., 2010; Hanington and Martin, 2012: 132, 152, 170; The Helen Hamlyn Centre for Design, 2013). I reappropriate such tools and techniques as figurative illustrations to interpret sociocultural environments and user behaviour, and to converge on particular design problems and opportunities. Experiencing the settings first-hand and making the experiential drawings apprehends my tacit knowledge and subjective encounters as a visual hypothesis. This allows me to consider the way forward in each case study and seek the expert experiences of others.

Tools and techniques for participation

I recontextualise the experiential drawings as tools to invite users' and stakeholders' responses in the second methodological stage. Inspired by the creative methods punctuating my discussions in chapter one, this participation builds on the socially inclusive creative expression afforded by King et al.'s co-design drawing sessions, the flexibility and materiality of probe-based methods, and the limited visual and textual information presented by the researcher-created template as a graphic data-gathering device (King et al., 1989; Gaver et al., 1999; 2004; Wall et al., 2005; Mattelmäki, 2006; Loxley and Prosser, 2008). Shaped by the specific conditions surrounding the case studies and my local objectives, the tools for participation are project specific and take the form of questionnaires, probes, and prompts and aim to spark qualitative written, drawn, and verbal dialogue with participant groups (Eriksen, 2009; Lucero et al., 2012). I apply these artefacts as aesthetic, empathic, and interpretative storytelling devices in community consultation focus groups, workshops, and materially mediated interviews (Mattelmäki, 2006: 59). Advancing notions of placemaking, these tools and techniques for participation seek to bridge my own and the participants' experiences and insights, and to support our joint speculations of ways to change, enhance, and improve elements of the local environments (Sanders et al., 2010; Steen, 2011; Björgvinsson et al., 2012).

Tools and techniques for evaluation-in-action

As the final stage of data collection I report on in chapter three, I begin evaluation-in-action by searching for patterns amongst participants' responses and qualitatively reorganising these as large format concept maps, illustrative matrices, and visual transcripts. Created rapidly and intuitively using manual and digital drawing techniques, these tools explicitly connect identified problems, opportunities, insights, needs, and themes (Burns, 2011). By their flow of arrows and associated connective words, organisational concept maps offer designers

an overview of gathered information and previously unrelated concepts whilst converging on specific ideas in a meaningful way (Gray and Malins, 2004: 41; Hanington and Martin, 2012: 38). Hanington and Martin categorise several exploratory mapping tools and techniques and promote the salient features of each. Territory maps are the result of individual designers' collaboration to visually define their collective research aims, stakeholder maps draw tangible parallels between all associated human entities, and thematic networks are used to systematically analyse collected qualitative data, as the examples in Figs 17–19 underline (Hanington and Martin, 2012: 176, 166, 178).

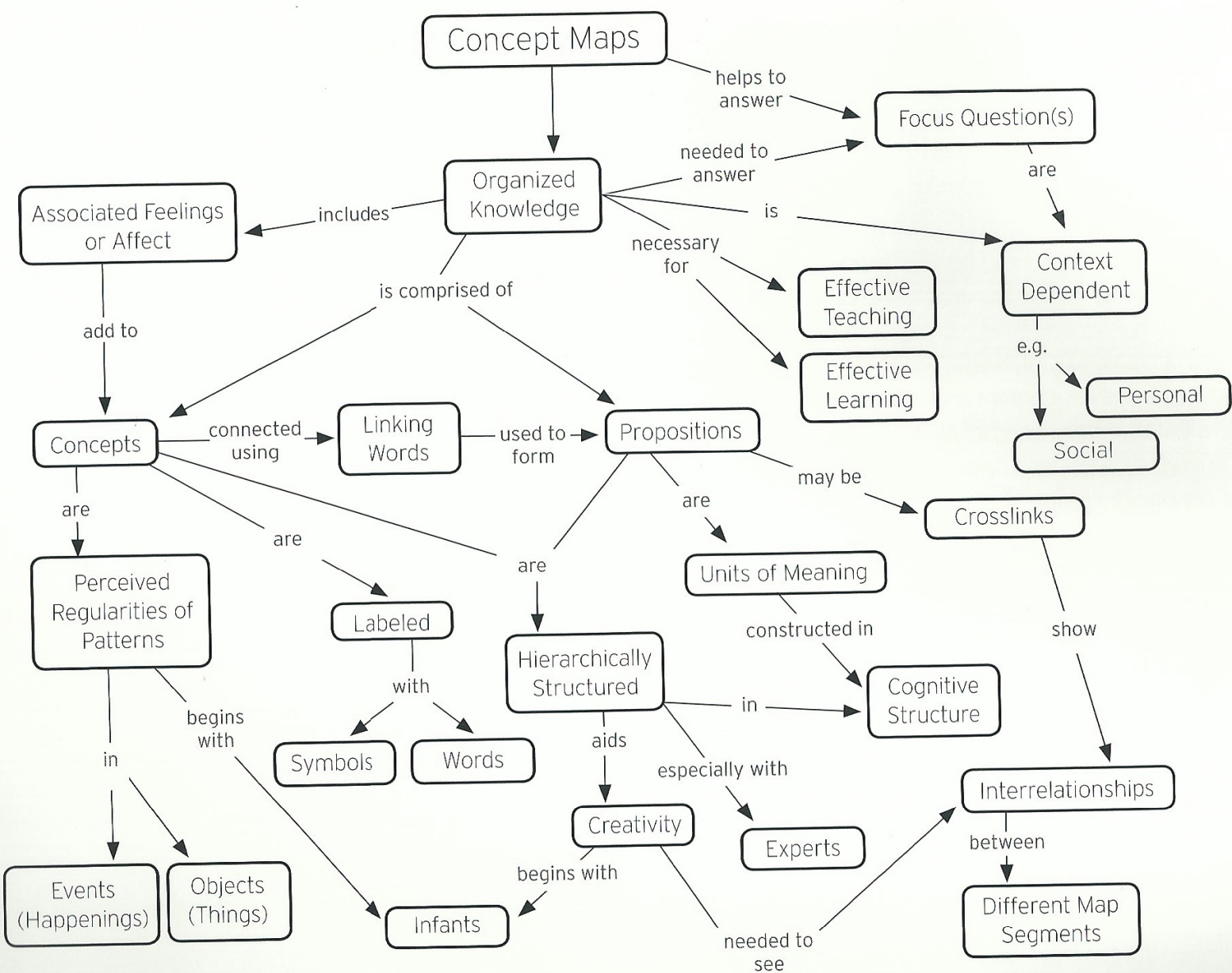


Fig. 17. Joseph D. Novak and Alberto J. Cañas (2012) *Concept Mapping* [diagram – detail]

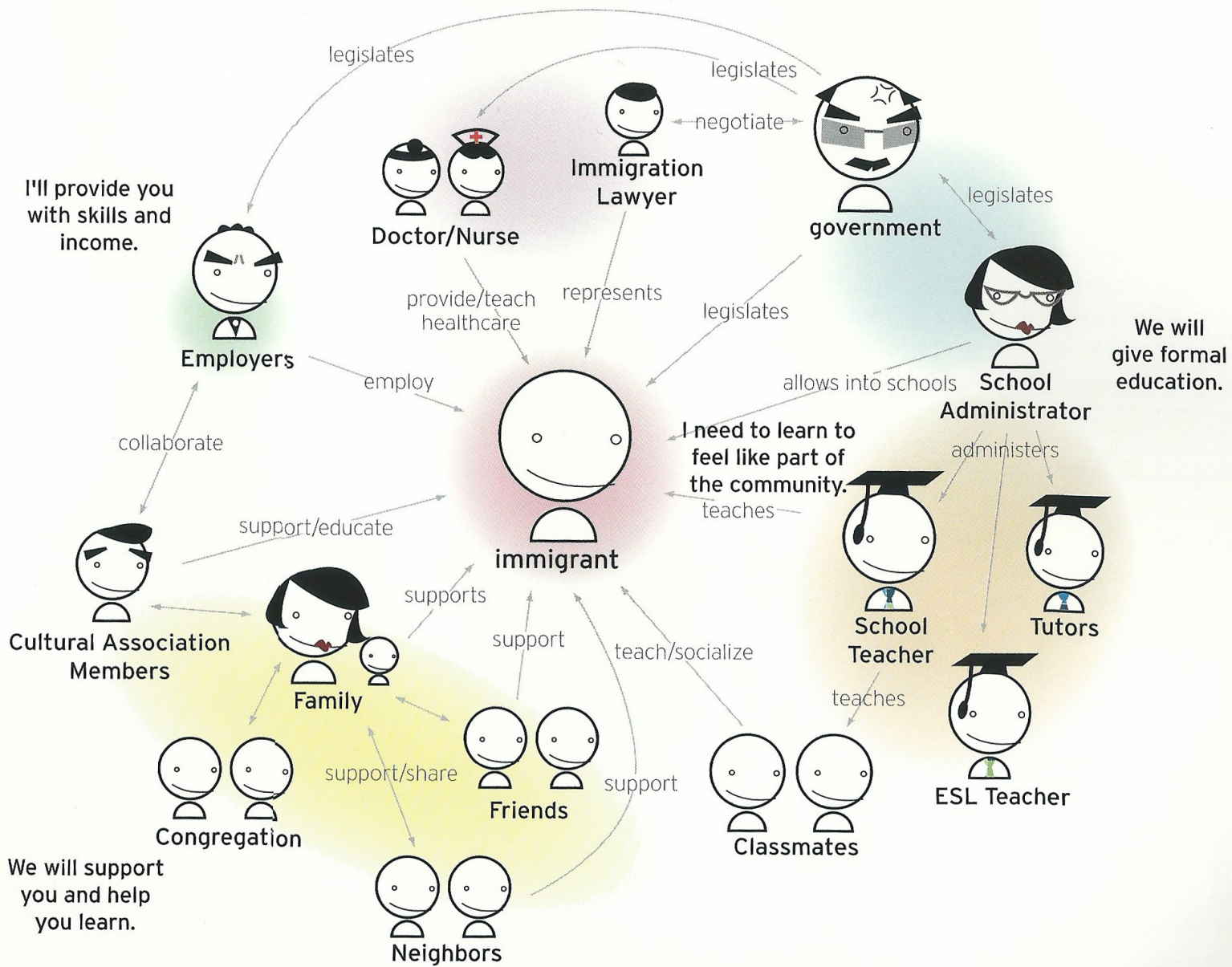


Fig. 18. Kim Dowd, Norman Lau, Gretchen Mendoza, and Hyori Park (2012) *Stakeholder Maps* [drawing – detail]

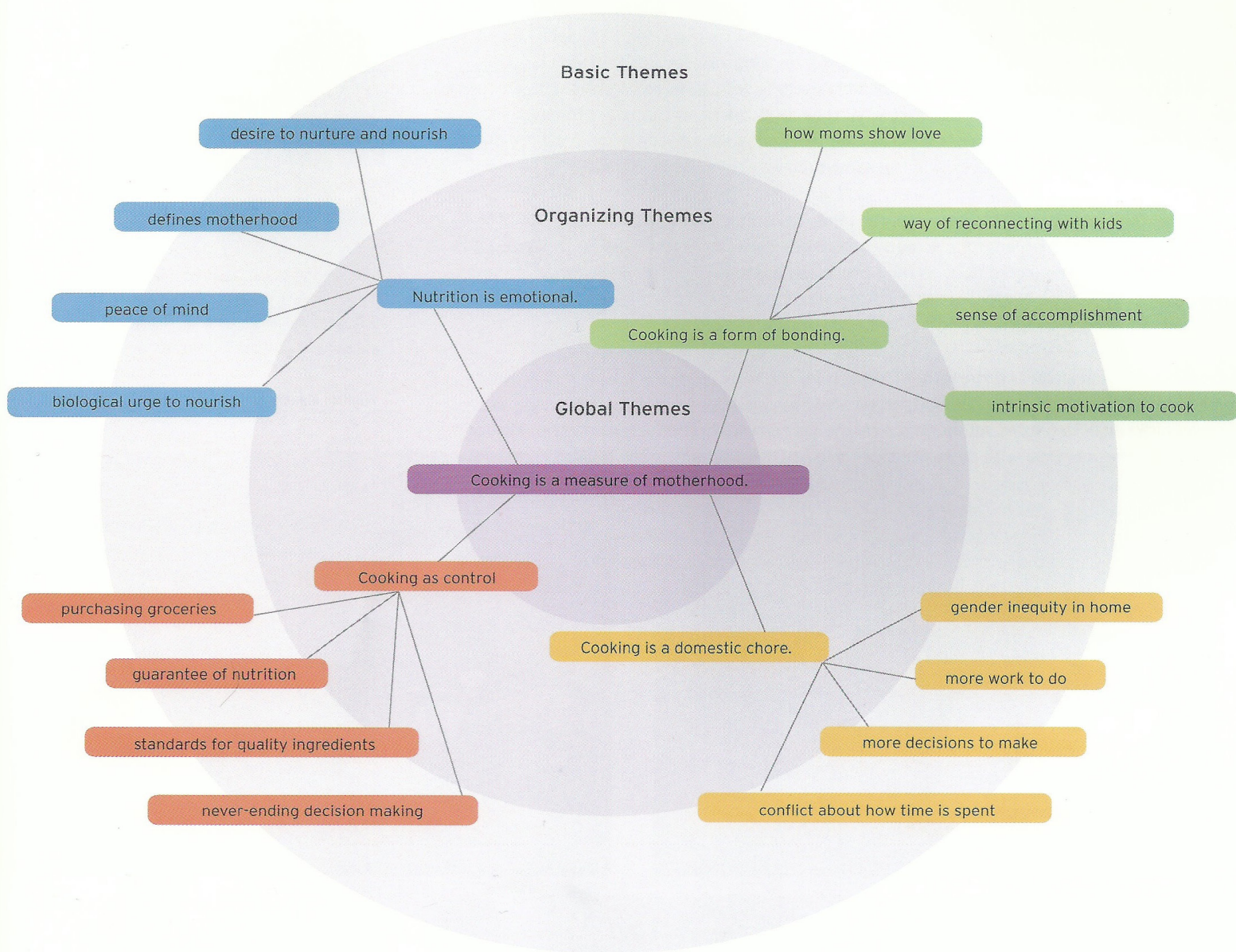


Fig. 19. Bruce Hanington and Bella Martin (2012) *Thematic Networks* [diagram – detail]

I adopt a flexible mapping approach that acknowledges the specific demands of each setting and the data afforded by the corresponding tools and techniques for participation (Gray and Malins, 2004: 55). Representing key terms as thumbnail illustrations, the completed artefacts' compositions are diagrammatic, rather than figurative. Goldschmidt confirms that 'experienced designers do not require an external prompt such as an experimenter's question to infer meaning from a sketch: they produce the sketch in order to have a dialogue with it, and the sketch's backtalk is the reward they get for bringing it into being' (2003: 87–88). Likewise, my bespoke organisational tools sustain my interpretations of participants' responses, conversing with and directing me to pursue design opportunities.

I then create storyboards, scenarios, and three-dimensional prototypes to propose alternative initiatives, services, systems, and interfaces. These tools and techniques invoke The Design Council's definitions of 'physical prototyping' and 'experience prototyping' (2013). As I experienced in the masterclass, in the former technique the designer tests their ideas in relation to the intervention's functional and sensory qualities. In other words, the emphasis here is on the interconnected nature of 'works like' and 'looks like' prototypes (Burns, 2011). As Hanington and Martin illustrate in Fig. 20, rough, low-fidelity visuals help uncover flaws and failures prior to implementation, overcoming the financial risks inherent in sending an unfeasible design to market and increasing the intervention's chances of success in its intended setting (Brown, 2009: 89–90; Hanington and Martin, 2012: 138). However, as the investigation aims to understand how visual and participatory tools and techniques can augment human-centred design interactions and inform designerly roles, these are not solutions developed for implementation, but are used iteratively in follow-up sessions to gather feedback on their feasibility and desirability (Schön, 1983).

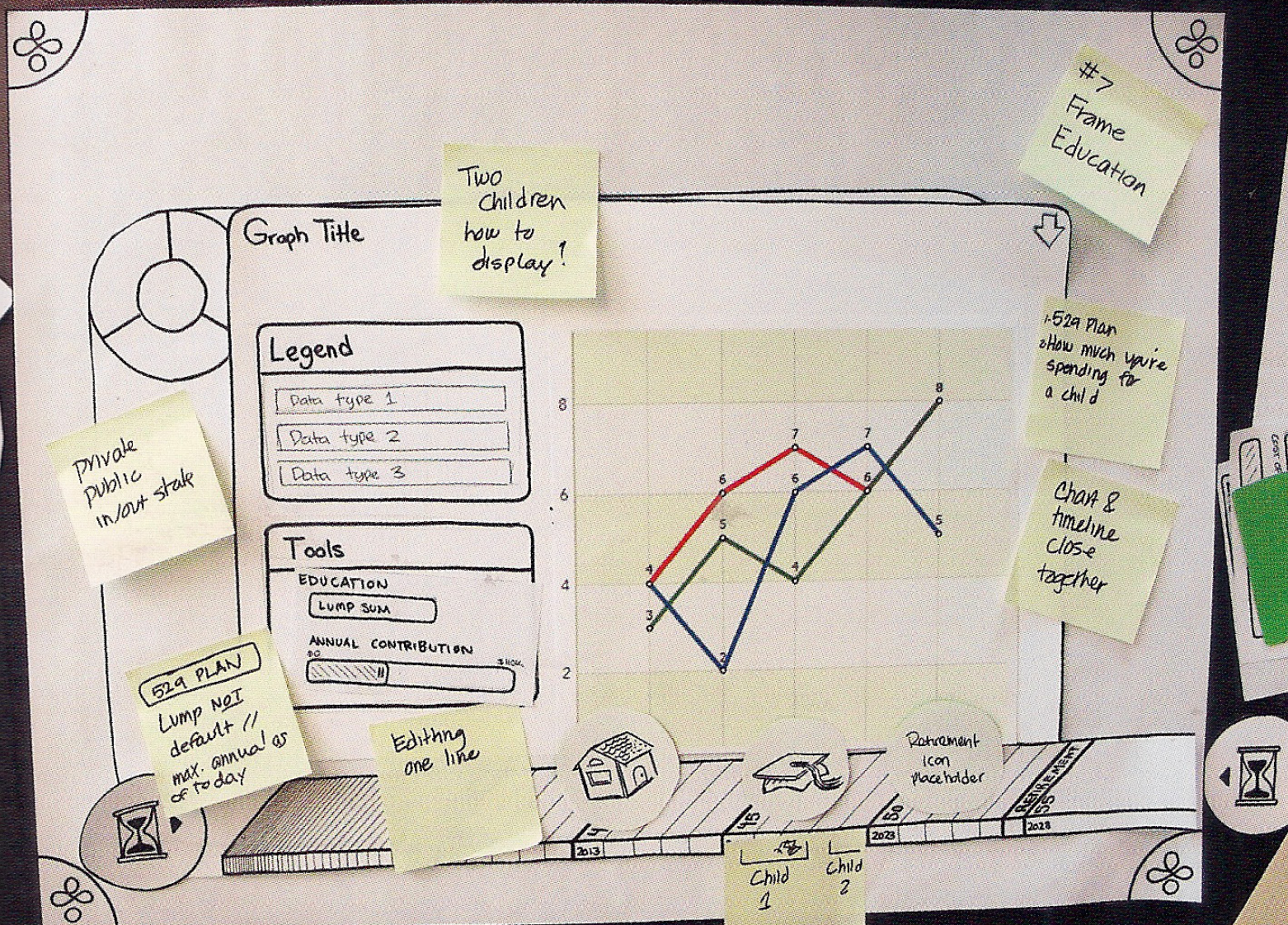


Fig. 20. Lilian Kong (2012) *Prototyping* [photograph – detail]

Presenting the storyboards, scenarios, and prototypes for local co-evaluation echoes what designers Kees Overbeeke, Stephan Wensveen, and Caroline Hummels term a 'physical hypothesis' (2006). Participating in acts of making and (mock) testing these artefacts instigates dialogue and provides additional opportunities for design refinement. This aspect of my methodology functions to collect participants' responses as a means of validation or 'member checking' as social scientist David Silverman advises, in a way which evokes, generates, and constitutes further data (2001: 236).

Tool response analysis

I glean concepts and categories from participants' responses in the fourth stage of my participatory-reflexive methodology. Construing intersubjective local insights from the case study settings through tool response analysis, I manually annotate the participants' tool returns and interview transcripts as reflexive records of my interpretations. This technique incorporates social scientific applications of qualitative content analysis to locate emotional insights embedded in drawn, written, and spoken data, and as a quantitative measure to make inferences based on the frequency of concepts within these research texts (Silverman, 2001: 122–124). In expounding the communicatory power of language, social scientist Charles Smith defines content analysis as a means of garnering participants' 'innermost thoughts, frames of reference, reactions to situations and cultural conventions that may be subconscious, hidden or unrecognised even by the individual subject' (2001: 313).

Appropriating tool response analysis as a practice-led, visual method to interpret discussions of prevalent sociocultural issues, I engage directly with the participants' tool returns as accumulations of raw data. I aggregate these holistically, highlighting pertinent words or phrases firstly as concepts, and attaching sticky notes to track the formation of emergent thematic groups as categories. This mode of analysis follows Gaver et al. and Mattelmäki's

assessments that cultural probe returns are too fragmented and eclectic to be formalised and generalised through scientific measures, and that their purpose is to provide designers with subjective, inspirational material to enrich their contextual inquiries (Gaver et al., 2004: 53, 55; Mattelmäki, 2006: 59).

In chapter four I chart my progression through this stage and present examples of the annotated artefacts in the volume of appendices and fourth section of the portfolio books. These display the concepts and categories encompassing my recognition of problems affecting participants, their individual and collective needs, and their suggestions of potential solutions, as well as any direct responses to the tools themselves. Categories are continuously revised as new concepts become apparent. Similar concepts are combined and arranged in a series of tables to quantify the dominant issues facing people who live and work in the case study settings. Comparisons of concepts within and across different categories develop and supplement my intuitive organisation of data in evaluation-in-action to verify that the storyboards, scenarios, and prototypes I proposed were grounded in the participants' responses. Moreover, in this stage I identify and later evaluate how the tools helped me surface meaningful sociocultural insights, generate ideas, and make decisions in human-centred design exploration.

Reflexive analysis

Mediating the research question and aims, in the fifth stage of my participatory-reflexive methodology I envisage the human-centred design process as a characteristically mutual activity to evaluate my interactions with settings and participants via the tools and techniques. In this reflexive analysis, I reconstruct and describe each case study from my experiential perspective. Attending to both the formal research-focused elements and the informal small talk that occurred (Goffman, 1963: 89), I subjectively identify the phases and activities that shaped each human-centred design process and the relationships they contained.

Supporting my development of autoethnographic drawings as tools to visualise case study stages and interactions, Carolyn Ellis frames autoethnography as a qualitative, descriptive approach that enables researchers to extrapolate cultural knowledge from their situated experiences of the field (2004: 30). Ellis extends this to distinguish between corresponding modes of narrative analysis and a 'thematic analysis of narrative'. Both permutations advocate that the researcher treats their own or participants' responses as completed stories and data in themselves, but the latter imposes a further analytic layer of meaning to reveal deeper cultural insights (Ellis, 2004: 195–197). I consider my experiences as being embodied in the techniques I have used and the tools I have designed. As such, I reflect on the case studies retrospectively and isolate instances in which my tools and techniques' presence had a profound effect on the social relationships I formed with participants. Reflexive analysis is thus akin to a thematic interpretation of narratives, employing visual expression to communicate experiential interactions in human-centred design exploration. As Ellis continues:

In line with autoethnography, arts-based researchers include the artist's subjectivity and present their work as embodied inquiry – sensuous, emotional, complex, intimate. They expect their projects to evoke response, inspire imagination, give pause for new possibilities and meanings, and open new questions and avenues for inquiry.

Ellis, 2004: 215

The use of autoethnography in human-centred design research is a relatively recent phenomenon, yet as design researcher Madeline Balaam points out, appropriations of designers' and researchers' experiences as data have led to practical recommendations for technological innovation in human-computer interaction studies (2011: 2). Indeed, the prevalence of participant observation and empathic methods within the toolkits confirms that when designers attempt to perceive existing situations and design solutions from the user's perspective and 'eat their own dog food', they achieve a shared understanding of their behaviours and needs (The Design Council, 2007b: 22–23). Developing the autoethnographic

dimensions of human-centred design fieldwork, design researcher Helena Karasti positions the designer as a community member, sociocultural explorer, and problem-solver:

In deliberating upon the researcher role that is appreciative of actual work practice and explicitly acknowledges change that is intertwined with systems design, I came to think of participant intervention as engagement in the co-construction of meaning. The role of *participant interventionist* is intimately based on the participant observer's understanding of work practice but also intertwines an explicit technology focus and change thinking.

Karasti, 2010: 6 (emphasis in original)

While Karasti's conceptions of the participant interventionist are helpful in framing autoethnographic design practice, my reflexive analysis is primarily concerned with unpacking how humans communicate and share experiences through visual and participatory tools and techniques, and how this informs their relationships and roles in the human-centred design process. Questioning the momentum of ethnographic methods in design research, industrial designer Lois Frankel highlights that their presence is weighted towards data collection, rather than analysis. To address this, visual modes of representation such as diagrammatic contextual experience models and illustrative scenarios provide designers with a vehicle for documenting ethnographic findings (Frankel, 2009: 3507, 3509). The hand-drawn style and comic book tone of the scenarios Frankel presents (Fig. 21) corroborate my methodological use of visual storytelling devices to report on design problems, opportunities, insights, needs, and themes.

USER SCENARIO 1

CHALLENGES OF INCLEMENT WEATHER



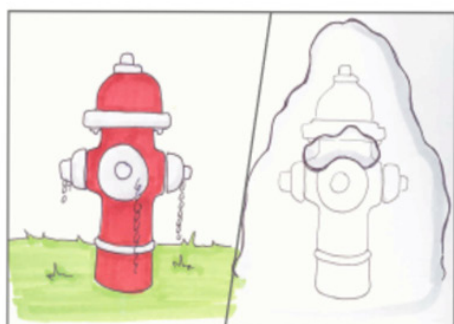
snow and ice are slippery
and mask ground textures



rain and falling snow can
obscure remaining vision



snowbanks are unpredictable
both in location and height



disguised landmarks



glare from ice and
snow can
temporarily blind users



sound of rainstorm and traffic in
puddles can mask auditory cues



Fig. 21. Elizabeth Mitchell (2009) *Scenario illustrations representing a visually impaired person walking in poor weather*
[drawing – detail]

Evaluating storytelling in user experience design, Whitney Quesenbery and Kevin Brooks discuss the ethnographic practice of writing descriptive fieldnotes (2010). They suggest that the personal stance adopted in 'confessional tales' communicates and shares the designer's subjective experiences, presenting design users with emotive representations, stimulating discourse, and reciprocating stories (Quesenbery and Brooks, 2010: 190–192). The expressive and compositional qualities of my autoethnographic drawings integrate Ellis' appraisals of subjective visualisation in artistic research (2004), the narrative character of anthropologist Clifford Geertz's 'thick description' in reporting ethnographic fieldwork (1973), and my reflexive interpretations of sociomaterial practices within human-centred design exploration (Orlikowski, 2005; 2010; Ehn, 2008; Orlikowski and Feldman, 2011; Björgvinsson et al., 2012). As with the experiential drawings created in the orientation stage, my selection of artistic materials and stylistic techniques are influenced by my subjective reflection on each case study experience.

Discussed in chapter four and presented in the portfolio books, the finished drawings function as tools to visually disseminate experiential and anecdotal data that were not captured by the tools and techniques, but encountered and interpreted reflexively by myself when engaged in different activities and adopting different roles. Incorporating sociologist Norman Denzin's premises of narrative inquiry (1989), I inductively analyse these narrative sketches in respect of my interactions with people, places, and methods. This promotes my analysis of Denzin's 'critical events' that occurred in and directed the human-centred design process. These events lead to subsequent 'epiphanies', which I appropriate as a further level of analytic insights: realisations that my creation, use, and interpretation of each tool have broader implications on human-centred design relationships, visual and participatory methods, and the role of the designer (Denzin, 1989: 70–71).

Layering and comparing the results of tool response analysis and reflexive analysis as a holistic package of intersubjective data, I make connections between the content, format, and tone of my methodological tools and techniques. This forms a substage in which I assess their parallel abilities to elicit information to advance the human-centred design process, and to foster understanding, empathy, rapport, consensus, and dialogue in my relationships with user and stakeholder participants.

The acquisition of drawn, written, verbal, and experiential insights alludes to the information and inspiration that can be constructed when human-centred designers adopt a simultaneous participatory and reflexive stance. Forming the original contribution to knowledge, my application of the five-stage participatory-reflexive methodology in the three case studies implicates Steen's (2008; 2011; 2012) and Davies' (2008) foregrounding of socially situated practitioners and researchers. As such, I go on to present three descriptive accounts of orientation, participation, and evaluation-in-action in the Rothesay, Islay, and Mackintosh Building settings.

THREE

Travelling through case studies: collecting data as souvenirs of human-centred design exploration

In this chapter I develop my examination of the research question – *which aspects and attributes of visual and participatory tools and techniques support designers in balancing their own subjectivity with the experiences and needs of participants* – by discussing how I employed my illustration and design practice to make, use, and interpret methods for data collection in each case study. As I set out in the central research aim, here I provide descriptive accounts of engaging with settings and participants to elicit and evaluate information. Employing my visual and participatory tools and techniques in environmental, community, and organisational placemaking contexts, I refer the reader to the three portfolio books – *Case study 1: Rothesay Townscape Heritage Initiative*, *Case study 2: Island wellbeing in Islay*, and *Case study 3: The Mackintosh Building user experience* – and to the volume of appendices as Port-R, Port-I, Port-MB; App-R, App-I, App-MB. These codes precede initials that indicate the location of the methodological images and artefacts in the orientation (o), participation (p), and evaluation-in-action (e) sections. Triangulating these stages of data collection, the focus of my discussion of each case study in this chapter is clarified by the highlighted branches of my five-stage participatory-reflexive methodological compass (Figs 22–24).

The case studies complement the Institute of Design Innovation's principles and strategy to enhance community wellbeing and promote the transferable application of a socially inclusive human-centred design process (The Glasgow School of Art, 2013a; 2013b). In line with Breslin and Buchanan's assessments of the case study method's benefits (2008: 39), my comparative evaluations in chapters four and five correlate and contrast local findings, establish their resonance with the wider discipline, and contribute the five-stage participatory-reflexive methodology to support human-centred designers in appropriating their professional creative practice and subjective experiences to engage with others.

Case study one: Rothesay Townscape Heritage Initiative

In Fig. 22 I set out how desk research, participant observation, and experiential drawing developed my understandings of sociocultural issues surrounding environmental regeneration in the Rothesay case study (Port-Ro). After detailing the information I discovered through these orientation tools and techniques, I explain how I made and used a *Visual questionnaire* to instigate drawn and written dialogue with residents. I then evaluated their responses and proposed a designed intervention to improve community cohesion and promote the town to visitors (Port-Rpe).

Collaborating with a group of MDes Innovation students for part of this project, I carried out four workshops to garner the methods they use in the initial stages of the human-centred design process (Broadley, 2011a). The workshops consisted of a short presentation of my previous design research, an onsite drawing session in a local park, a discussion of our expectations of Rothesay, and a visual mapping activity to collectively suggest design opportunities. Following each activity, I provided the students with an open-ended questionnaire to gather their written reflections. As I refined my research aims and case study objectives, these aspects became less significant, and limitations on the length and scope of the thesis and portfolio negate a detailed account of these activities. I do, however, include an edited selection of photographs from the workshops in the appendices to outline my own developing knowledge (App-Ro). After these sessions, we facilitated our individual tools in the first of two community consultation focus groups. As such, I evaluate my relationship with the student group and how it informed this participation stage of the study through the *Rothesay autoethnographic drawings* and my analyses and evaluations in chapters four and five (Port-Rr).

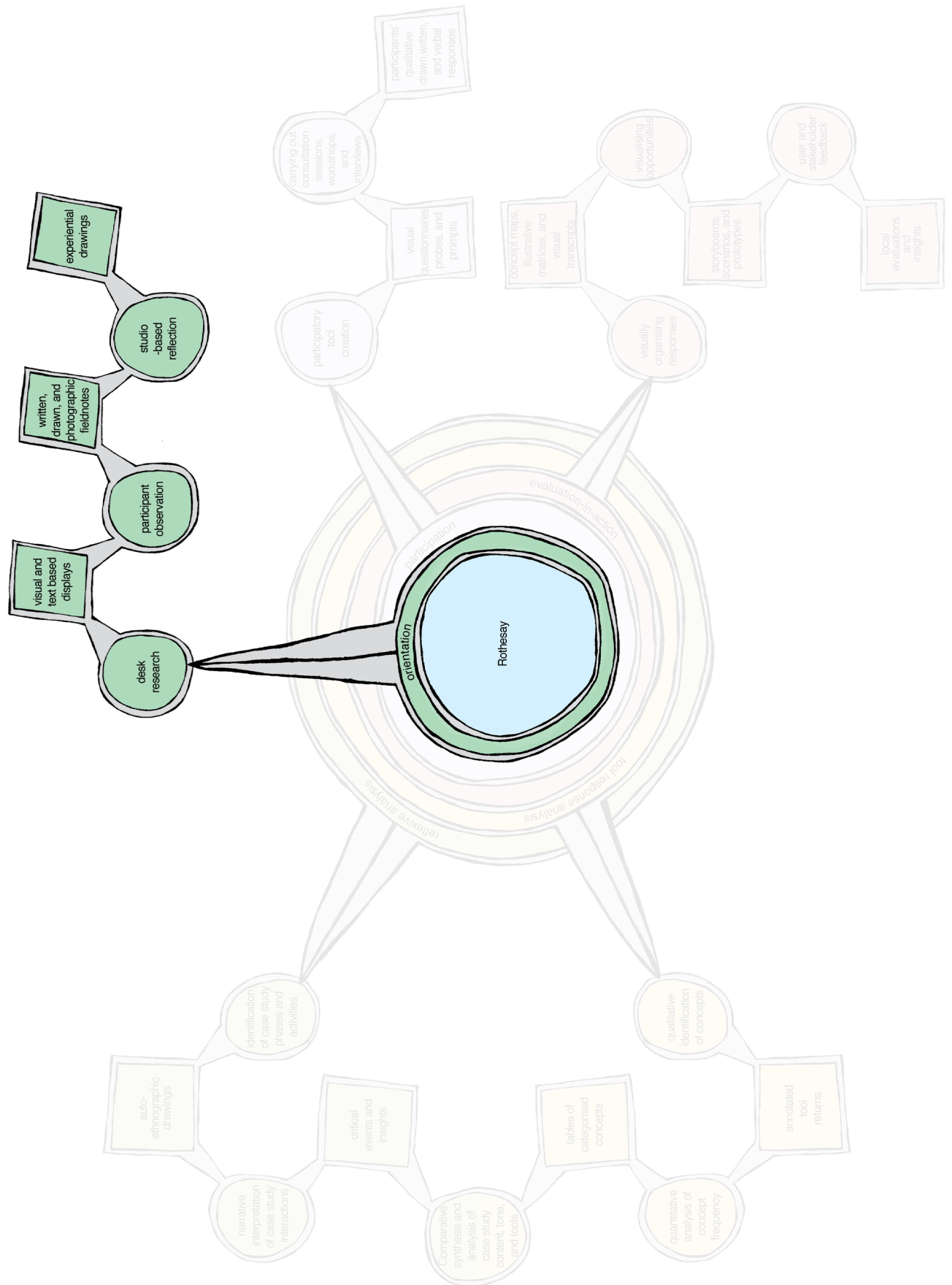


Fig. 22. Cara Broadley (2013) *Using my five-stage participatory-reflexive methodological compass 1: orientation in the Rothesay case study* [diagram]

The Rothesay Townscape Heritage Initiative (THI) on the island of Bute provided me with a setting in which to examine environmental placemaking and community participation. I made this decision in response to conversations with GSA's MDes Innovation staff while they devised a brief for an Environmental Design elective (The Glasgow School of Art, 2010; 2013b). Upon being invited to work with the students to investigate Rothesay residents' current experiences and future aspirations for their town, I discussed the THI's objectives with the Project Officer (PO) (Broadley, 2010). The THI arose as a collaborative venture between Argyll and Bute Council, Placemaking Scotland, and Greenspace Scotland. Attempting to enhance its assets of attractive scenery, historical landmarks, and links to the rest of Bute, the THI were striving to redefine Rothesay as thriving town to live in and a vibrant tourist destination for the 21st century. Affiliating Rothesay's physical appearance with its social uses was central to the THI's rationale:

Rothesay is a friendly and welcoming town, with a range of unique attractions and shops and services. It should be somewhere that local people and visitors alike want to spend time. Unfortunately, at present, the condition and appearance of the town centre; relatively low levels of promotion of the town; the shortage of activities and a lack of social spaces all combine to make Rothesay a place you pass through quickly not one where you would choose to linger. (Rothesay is "slippery" when we would prefer it to be a "sticky" place). The absence of other people means that the town centre does not feel like a social place. The public realm – public spaces and streets – has an important role to play in creating opportunities and reasons for locals and visitors to spend more time in the town.

Argyll and Bute Council, 2010a: 7

As outlined in *Visualising Rothesay desk research*, I explored the town's history, architecture, cultural initiatives, community-based activities, maritime pursuits, tourism, local industries, demographics, ferry service, crime, and employment (Port-Ro). In making this diagram, I began to establish tensions surrounding Rothesay as a romantic and leisurely traditional Scottish town and its more recent state of environmental, sociocultural, and economic decline. I realised that my

own impressions of Rothesay were clouded by my grandparents' stories of day trips in the early 20th century and the displays of commemorative souvenirs and brochures I had seen in Glasgow's People's Palace museum. The colloquialism *doon the watter* acknowledges this nostalgic identity and references the journeys made by city dwellers down the river Clyde to enjoy the holiday atmosphere of Rothesay and other nearby costal resorts. Its prevalence in the many visitor information websites suggested to me that the town revelled in its previous incarnation and yearned to be restored to its former glory (BBC, 2010; Argyll Online, 2013; Glasgow Museums, 2013). A 'Rothesay Perceptions Survey' summarised that 52% of residents were dissatisfied with the appearance and functionality of the town centre (EKOS: Economic and Social Development, 2010: 14). I noted the presence of 'gap sites': spaces in Rothesay's streets where a derelict building had been demolished, but no new structure had been built in its place (Argyll and Bute Council, 2010b: 4). This diverse data led me to consider the town's lack of consistent identity and an imbalance regarding the needs of residents from different age groups, business owners, commuters, holiday makers, and day trippers. Desk research informed my evolving perceptions and my need to gain a deeper grasp of the THI and the town first hand.

I documented my journey photographically to quickly evoke the routes I decided to take, the sights I saw, the instances I deemed important enough to capture. Back in Glasgow, I distilled my collection of 156 intuitively taken photographs down to the twelve shown in *Rothesay snapshot photography*. These sources reported on my journey, but a subsequent drawing phase promoted my reflection on the relationship between Rothesay's physical environment and its sociocultural identity (Goldschmidt, 2003; Barrett, 2007). Using a marker pen and ink technique to make the *Rothesay experiential drawings*, I mapped the townscape with blocks of colour before imposing line as an additional layer. Although intended as product and graphic designers' tools, the marker pens' application and aesthetic had an affinity to watercolour painting and positioned the drawings as nostalgic, commemorative artefacts, emphasising and exaggerating my Rothesay encounter ([Port-Ro](#)).

The ferry journey should be a time and place of expectation, anticipation, and excitement, but in reality it felt sterile and generic. Crossing the platforms intersecting the marina upon my arrival, I noticed the town's mismatched rust-coloured tenements from a picturesque distance. This led me past a row of closed shops and into the relative desolation of Guildford Square. It was elevated like a stage, but I was the only performer. Benches outlined its edges, yet there was no audience. To the right of the square I found one of the gap sites – overgrown with weeds, bound by iron gates and a seemingly permanent 'Merry Christmas' sign. A group of teenagers leant against its barriers to eat their chips and smoke their cigarettes. Around the next corner, an empty souvenir shop advertised t-shirts printed with photos of Rothesay's palm trees. Sporadically, pensioners flitted between the post office and the butcher's shop. The shopfronts' crumbling and flaking wooden frames contrasted their resilient Victorian floor mosaics. Some shops displayed handwritten notices to excuse their seasonal winter hibernation when tourist numbers are low, others were boarded up completely. Confused palm trees and stoic royal blue lampposts punctuated the promenade and guided me towards the much-anticipated Victorian Toilets. At the ferry terminal again, I pondered the yachts without owners. The town was pretty, but lonely. It felt abandoned, or lost at sea. Yet, nostalgic glimpses of its past popularity were still present and somewhat preserved, as if on display in a neglected museum. Rothesay precariously balanced tradition and progression, old and new, preservation and promotion. The *Rothesay experiential drawings* underlined a problematic dichotomy between nostalgic charm and social inactivity, and presented Rothesay as a landscape, a backdrop, a set, and a place of environmental potential (Port-Ro).

By recording, layering, and opposing these iconic reminders of the past, the grit of the present, and promise of the future, experiential drawing posed several questions. Where do tourists go? Where do residents go? Do the two come together? What motivates people to visit and live in Rothesay? How can the THI unite the town in activities and services that meet the needs of both user groups? *Expectations of Rothesay* and our *Collaborative Rothesay idea-generating map*

evidence how the MDes students and I visually documented our interpretations of Rothesay's identity and began designing tools to discover residents' experiences, needs, problems, and aspirations (Broadley, 2011a; [App-Ro](#)). We reviewed these objectives with PO and the Community Development Officer (CDO) who were keen for us to collect residents' insights in a community consultation focus group (Broadley, 2011b). The THI were already seeking input from the community (EKOS, 2010), but as CDO's comments indicate, residents were becoming disenchanted by traditional questionnaires:

I think the idea of a visual questionnaire is fantastic. As the Local Development Officer on the island, I am well aware that the residents of Bute have completed a number of questionnaires over the last few years and are tired of the traditional format. I am sure they would relish the opportunity to voice their ideas and opinions in a new, innovative and compelling way.

CDO in Broadley, 2011c

I appropriated the *Rothesay experiential drawings* as anchor points to invite and record residents' feedback. Recognising a need for community cohesion in parallel with the THI's goals, I designated them each with a theme: *the ferry, arriving, meeting places, gaps, produce, souvenirs, architecture, tourist information, landmarks, and leaving*. I then traced my drawings digitally, rendering their painterly lines straight, transforming them into a uniform grey, and removing all presence of the marker pens. To contextualise these thematic visions of the Rothesay townscape as *Visual questionnaires*, I constructed ten sets of open-ended guiding questions ([Port-Rp](#)). Inspired by the researcher-created template concept I discuss in chapters one and two, these encouraged residents to recall their experiences of living in Rothesay and use writing and drawing to suggest ways to enhance the town (Wall et al., 2005; Loxley and Prosser, 2008: 30). I centred the question sets inside speech bubbles, attached the simplified drawings as liftable flaps, and positioned each *Visual questionnaire's* theme on a Rothesay signpost motif. Developing King et al.'s use of collaborative drawing techniques in

community placemaking, participants were invited to choose a theme that they felt most strongly about (positively or negatively) and lift the flap to read the questions before annotating the linear drawing with their responses, thus sharing their experiences and opinions in a visually immediate and accessible way (King et al., 1989). Residents attended the community consultation focus group on a drop-in basis, where PO and CDO provided updated information on the THI and our team of student designers facilitated their interactions with our tools (Broadley, 2011d). I made an illustrative instruction flyer to clarify the process to the residents (App-Rp).

I collected 29 returned *Visual questionnaires* from the residents, which are subjected to tool response analysis in chapter four. Whilst immersed in evaluation-in-action, I created the *Rothsay responses concept map: illustrating and organising community questionnaire responses* (Port-Re – a large format version can be found in the pocket at the end of this portfolio book). Assessing the residents' writings and drawings, I extracted, interpreted, and organised their insights and ideas within a further ten themes, denoted by the accompanying key. Using thumbnail illustration, I revisualised and collaged residents' aspirations into three broad categories: *identity and information, regeneration and reinterpretation*, and *culture and cohesion*. In the first category (top circle), I outlined their views that Rothsay must offer visitors more accessible information, such as updated public transport timetables, event guides, and a map when purchasing a ferry ticket. In the second category (middle circle), I consolidated residents' discussions of the town's physical regeneration, namely the renewal of shop fronts, maintenance of architecture, and redirecting the flow of traffic and pedestrians through the streets. The third category (bottom circle) brings together residents' suggestions for improving community spirit, cultural activities, and social enterprise.

Responding to these categories as the shared values and goals of local residents and the THI, I turned my attention back to Guildford Square and considered how redesigning this central space could improve community cohesion and encourage

visitors to spend time in the town. My recent experience as a European tourist prompted my examination of how Venice has harnessed its historical assets to meet the needs of visitors and residents. I conceptualised the city's promotion of its rich heritage and tourist services in my *Twin approaches to tourism: exploring how Venice uses its heritage for economical gain* visualisation (Port-Re). This inspired a speculative initiative to rebrand Rothesay as an exciting destination for visitors and to strengthen civic pride amongst residents, while acknowledging the THI's objectives to improve access and linkages, comfort and image, sociability, and use and activity (Argyll and Bute Council, 2010a: 4).

The Haste ye Bute prototype: a service to enhance visitor and local experience is depicted in a storyboard format of interconnected circles containing drawn scenarios and explanatory text (Port-Re). It begins with a second phase of insight gathering from visitors travelling on the ferry to qualitatively gather their motivations, expectations, and experiences of Rothesay. Their written responses would then be evaluated and fed back to businesses in a participatory workshop to construct a range of visitor incentives. These would form the basis of the 'Haste ye Bute Card', consisting of coupons for discounts and free gifts in shops and restaurants, access to museums and other cultural events, a map, and bus and ferry timetables to help visitors orient themselves in the town and wider Bute. A launch event would promote the card in Rothesay, raise community awareness of the service, and position Guildford Square and the gap site as a central community hub. To support local industries and present a thriving image of the town to visitors, food producers would be invited to sell their goods in a farmers' market platform. School pupils and residents would be recruited as textile designers and mentored to illustrate digitally printed panels for a set of bunting. Uniting Rothesay's younger and older generations and personalising Guildford Square as a gateway to the island, the proposal aims to welcome visitors and to instil residents with a sense of community ownership over their town. As I go on to analyse reflexively in chapter four, PO and CDO invited me to display the *Haste ye Bute prototype* at a second community consultation session to gather residents' feedback (Broadley, 2011e; 2011f).

In this case study, the tools and techniques for orientation and my creation of the *Visual questionnaire* allowed me to externalise and interrogate my personal experiences of Rothesay as a visitor and as a designer. In turn, the community consultation sessions instigated drawn, written, and verbal insight gathering, idea generation, and decision making with residents, as mediated by these tools and techniques. The residents' responses I collected through the *Visual questionnaires* informed and inspired the project's conclusions and my goals for the second case study. I reflected on the research question and began to explore more open, playful, and expressive methods to gather experiential stories in participatory sessions.

Case study two: Island wellbeing in Islay

Focusing on the participation stage of the Islay case study, I follow the sequence of tools and techniques shown in Fig. 23 to describe my creation of two design probe packages and explain how these were facilitated with a class of high school pupils to discover their perceptions of island identity and community wellbeing (Port-**lp**). At the same time, I provide brief accounts of the orientation stage and the subsequent community-based initiative that I proposed in evaluation-in-action (Port-**loe**).

I worked with a second group of MDes Innovation students throughout this case study. As in the Rothesay case study, I do not elaborate on the social aspects of our collaboration in this chapter, but go on to evaluate their implications on human-centred design relationships later in the thesis (Port-**lr**).

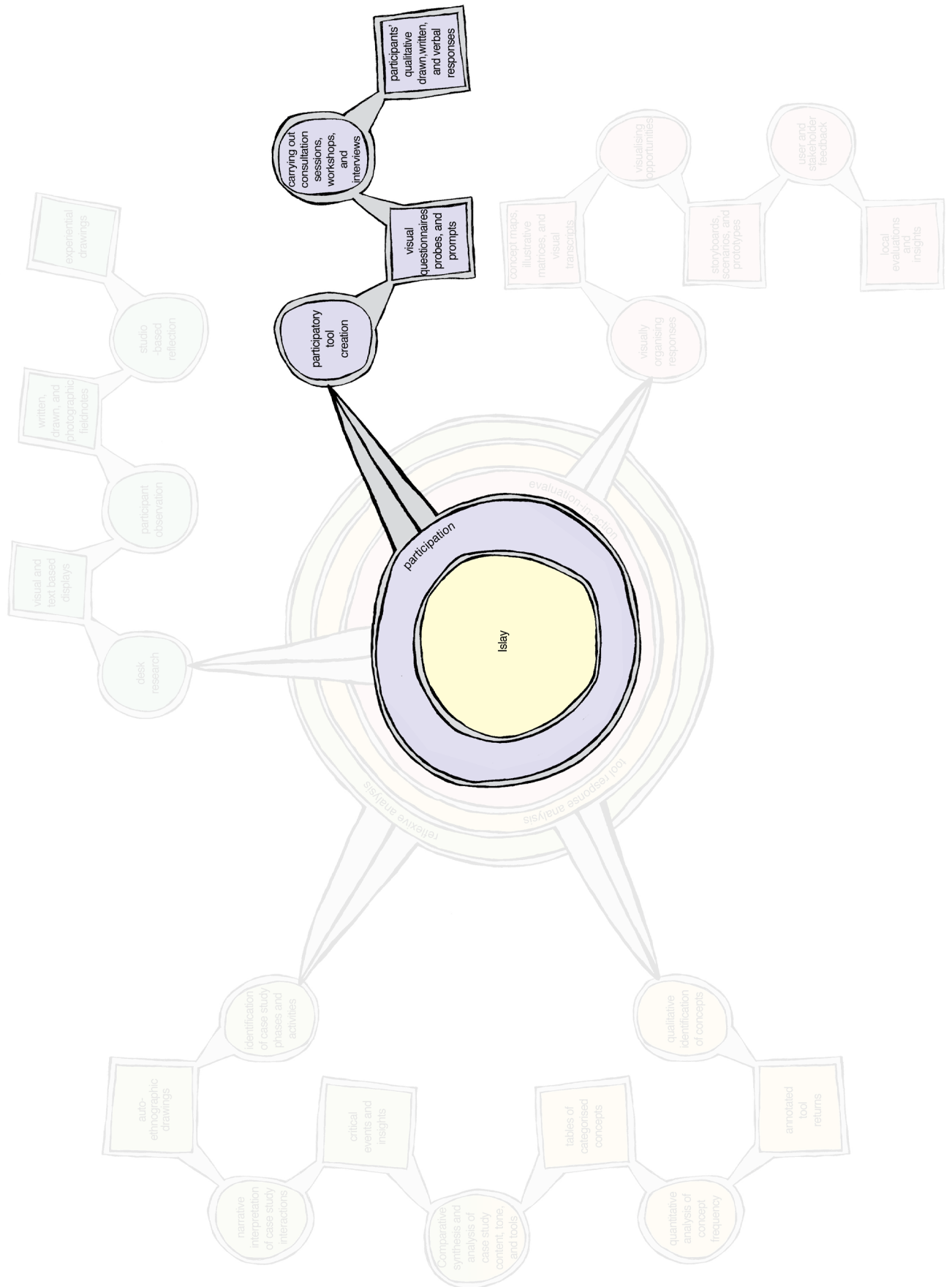


Fig. 23. Cara Broadley (2013) *Using my five-stage participatory-reflexive methodological compass 2: participation in the Islay case study* [diagram]

Situated in the inner Hebrides of Scotland, the island of Islay was chosen as an exemplar 'deprived and fragile' rural community within the remit of the Institute of Design Innovation at GSA. Our brief asked us to utilise human-centred design research methods to investigate island wellbeing and conceive ways to reposition Islay as a culturally, socially, and economically sustainable collection of communities (The Glasgow School of Art, 2011; 2013a). Due to the project's short timescale and Islay's remote location, we were unable to visit during orientation. Through desk research however, I explored the island's historical status, its diverse wildlife, geological factors, public transport, ecology and energy awareness, the prevalence of the traditional Gaelic language, and socioeconomic factors, namely health, employment, and education. Scoping Islay's local resources, I also recognised the island's whisky distilling industry, tourism, forms of retail, creative initiatives, and the farming and fishing industry. My hand-drawn map, *Visualising Islay desk research*, illustrates many of these aspects alongside my converging interest in accessing local knowledge ([Port-lo](#)). I made connections between Ionad Chaluim Chille Ìle (The Columba Centre for Gaelic languages and culture), The Islay Gaelic Choir, and a national importance placed on Gaelic education across Scotland (Ionad Chaluim Chille Ìle, 2010). This emphasis on Islay's storytelling heritage led to a conversation with my mother about our family's ancestral link to the island:

When I was young, my gran told me about how her dad's...cousin, I think – Lachie McFadyen – was reputedly the strongest man in Islay because he could lift a donkey over a hedge, backwards! Well, years later, I think about 1975, dad and I visited the island for a holiday. I wanted to find out more about this relative and I got talking to the owner of the hotel in the pub one night. I started to tell him the story and said excitedly “He was something of a local legend! He was the strongest man on the island—”. At that point, he interrupted me to exclaim smugly “Oh, is this the story about the guy who could apparently lift a donkey over a hedge backwards?!”. Everyone else in the pub fell about laughing while another customer explained that they regularly have to tell gullible tourists that the story is a myth! I felt so embarrassed and disappointed. I suppose I'll never find out the truth behind our supposed donkey-lifting relative!

Grace Broadley in Broadley, 2011h

Listening to my mother recall this anecdote reduced my feelings of distance from Islay. As the culmination of my own desk research, an alternative to observational photography, and a form of experiential drawing, my instincts as a designer motivated me to illustrate her tale in *Visualising verbal stories* (Port-lo). These linear cartoon-like sketches highlighted a potential design opportunity to investigate relations between the island's elderly residents and its teenage community through visual and participatory tools and techniques.

During this orientation phase, our student team created a shared archive of information, designating the *Collaborative Islay desk research map* for distilling and displaying emergent data (App-lo). On this, we attached sticky notes to symbolise key landmarks, hung miniature bottles of whisky and pinned illustrations of indigenous and migratory animals to signify the locations of distilleries and habitats, marked the position of the airport, and sketched dotted lines to connect Islay's two ferry ports to mainland Scotland and the neighbouring Isle of Jura. We noticed that much of our annotations were clustered around the village of Bowmore. Regarded as Islay's 'administrative capital', Bowmore hosts a distillery, the iconic Round Church, the tourist information centre, The Columba Centre, and Islay high school (Islayinfo, 2011). Its technologically innovative attitude to learning methods and equipping pupils with transferable vocational skills through the Scottish Government-led 'Schools of Ambition' programme drove us to select Islay high school as a context for a participatory workshop, as our *Collaborative Islay participant mapping* drawing sets out (Davidson, 2007; App-lo). Our early search for island demographics revealed that in 2001, Islay had a population of 3457 residents, 22.2% of which were under 18 years old (Scottish Census Results OnLine, 2012). Seeking a young person's perspective on island identity and community wellbeing, we made arrangements with the school's head teacher and principal technology teacher to engage with a class of 32 first year pupils (Broadley, 2011i).

Working under the name 'Pilotlight', we prototyped tools to assist our inquiry into island life. To facilitate a hands-on activity, collect experiential insights, and

advance the exploratory human-centred design process, we were drawn towards the cultural probe method and developed its material properties as a participatory approach to community placemaking (King et al., 1989; Gaver et al., 1999; 2003; 2004; Mattelmäki, 2006). We created two probe packs. The pupils would complete one in the workshop session, while a second was posted and distributed to each pupil two weeks before. The three tools contained in the *Islay pre-pack* sought to initiate a dialogue remotely, prior to our visit (*Port-!p*). One of our team developed her interests surrounding the retail industry, souvenirs, and material culture by asking pupils to fill a labelled envelope with ephemeral items accumulated during a typical day. Derived from our desk research surrounding island identity and cultural traditions of storytelling, another team member created a *Story map* book featuring illustrations and guiding questions, encouraging pupils to collaborate with a family member and use drawing and writing to share a story about their lives. Digitally illustrating and relaying my mother's anecdote in the storyboard/postcard format of *Rural Legends*, I sought to introduce pupils to ideas of visualisation in preparation for our participatory workshop. We assembled these tools into bundles, tied them together with twine, and attached a luggage tag printed with brief introductions and instructions.

With the Pilotlight logo, image of the island map, and consistent language and print production, the *Islay workshop pack* emulates the visual tone and material properties of its predecessor (*Port-!p*). Its folded burgundy and gold cover echoes the iconography of the British passport, signifying our journey from Glasgow to Islay and anticipating the cultural information we sought. Inside, my profile card asked for pupils' names, where they live and who with, and for a drawing of themselves to be sketched in the space provided, allowing us to keep track of each pupil's individual responses as well as discovering details of their daily commutes, the size and diversity of their family units, and insights into personal identities. To construct a picture of Islay community champions, one of our team made a deck of six *Islay playing cards* asking pupils to indicate their local heroes and idols, and to consider the next fifteen years and draw a vision of their future. Expanding on the theme of career goals, another designer's cardboard *Magic*

camera invited pupils to look into its viewfinder and visualise their ideal occupation. In this way, we aimed to connect career routes to local industries, and to infer why some young people pursue employment on the island and others choose to relocate to the mainland. Islay's familiar outline is a dominant visual motif throughout both packs and was juxtaposed with text in a map poster examining the pupils' tacit knowledge of tourist landmarks. Accompanying stickers condensed aspects of our desk research into small photographs which pupils were instructed to attach to relevant locations on the map. Attempting to directly locate problems, one team member produced a simplified drawing of a litter bin, encouraging pupils to metaphorically dispose of their island dislikes. Meanwhile, my pair of empty speech bubbles invited pupils to share and translate a common island phrase into Gaelic, helping us evaluate the extent of the pupils' bilingual fluency and partly addressing fluctuating declines and revivals of the language. Although not manufactured by the team, we included a small pile of sticky notes in each pack to use in a rapid brainstorming session exploring how often the pupils visit the mainland and any significant facilities and services that are unavailable on the island.

Mirroring the layout and concept of *Rural Legends*, the *Islay workshop pack* also includes a *Story postcard* with four empty frames. This provided the pupils with an opportunity to narratively visualise aspects of local knowledge that are otherwise inaccessible to visitors. The tools linked our exploratory desk research to a more focused phase of community engagement and insight gathering. Our lack of direct familiarity with the island and its people propelled the cultural probe towards its template format, combining direct questions and empty spaces to support the pupils' self-expression in an open platform. The material presence and conceptual connotations of luggage tags, passports, envelopes, cameras, maps, and postcards symbolised our desire to discover cultural information as both visitors and designers.

In order to manage the session within a two-hour slot, we allotted five to fifteen minutes for each *Islay workshop pack* tool and corresponding activity.

Four teachers provided additional facilitation assistance. Their presence was beneficial as it validated our project's significance to the pupils, encouraged their participation, and helped supervise their behaviour. I verbally reminded the pupils of *Rural Legends'* narrative and gave instructions on how to carry out the *Story postcard* task. Similarly, the other designers briefly introduced their pack components before leading conversations with smaller pupil groups as they responded through text and imagery (Broadley et al., 2011).

Following the workshop, we grouped, photographed, displayed, and regrouped the pupils' completed *Islay pre-packs* and *Islay workshop packs* to locate opportunities to inspire our interventions. One of the team scrutinised the pupils' limited career plans and proposed an educational game to expand their options, while another student designer identified the pupils' lack of Gaelic fluency and designed a collection of labels to integrate the language into their domestic routines (Bell et al., 2011; App-le). In my own individual evaluations, I focused on the returned *Story postcards*. Of the 32 pupils, only one pupil did not complete this tool, and one of the 31 completed tools was returned with an incoherent scribble spanning its four frames. As I go on to develop in chapter four, I categorised these responses and noted that concepts of history, achievement, celebrity, heritage, and family were constant themes throughout the pupils' imaginative and anecdotal stories.

Some pupils described the experiences of their family members, historically and more recently. One pupil's grandfather was involved in managing Glasgow Celtic football club and, as she wrote on the opposite side from her drawings, 'he was a bit FAMOUS!'. Developing the idea of family members as celebrities, a pupil drew a bridge built by her great, great grandfather and explained that it was the only one on the island to survive a severe thunderstorm. Another told us about her father, an ambulance driver, being interviewed on the regional news when he found an inexplicable dead wallaby on one of the island's country roads. This was contrasted by two pupils' drawings of shotguns and knives to proudly exclaim that their fathers once 'killed a deer'. Contemplating her own life in relation to her

family's heritage, another pupil drew a fishing boat and a factory, highlighting on the postcard's reverse that her father is the director of Islay Crab Exports and named his boat after her (Broadley et al., 2011).

To gain a broader overview of pupils' portrayals of family in island life, I created the *Islay responses data evaluation matrix: identifying concepts of family in returned probe pack tools* (Port-le – a large format version can be found in the pocket at the end of this portfolio book). I extracted their self-portraits from the profile cards, designated each pupil with a row, and populated these with a series of digitally designed icons. Based on a family tree theme, a germinating seed, a fully grown tree, a cross section of a tree trunk, and a tree-like character respectively account for the number of pupils who told stories about themselves, their immediate family members, their family heritage, and local legends through the postcards. A tree house icon determines the number of residents in each pupil's home, a tree with a rosette symbolises pupils who referred to a family member as a hero or idol, and the icon of a tree being felled refers to the pupils who put a sibling 'in the bin'. A tree with no leaves represents the two pupils who did not discuss their family in completing the *Islay pre-pack* or the *Islay workshop pack*. Dotted lines leading to photographs of their completed tools highlight the nine pupils who made the most references.

I designed two storyboards to reinterpret the pupils' roles in the human-centred design process and to share family stories across and beyond the island. In *Family as Community storyboard 1*, the pupils identified in the *Islay responses data evaluation matrix* are initiated as 'Pilotlight Apprentices' (Port-le). In a one-day workshop, they would be equipped with simple insight-gathering tools and techniques, have the chance to design new cultural probes tailored to their family members' daily routines and personalities, and trained to lead and document informal workshops to collect their families' experiences of island life. Following this, the apprentices and myself would co-evaluate the data by searching for patterns and themes. *Family as Community storyboard 2* seeks to communicate Islay family histories and identities throughout local, regional, national, and

international networks via a community-led Islay guidebook (*Port-le*). Profiling each participating family, this would celebrate everyday elements of family life including the objects in their homes, their likes and dislikes, hobbies and interests, ancestry, holidays, traditions, favourite Islay landmarks, family mottos, nicknames and running jokes, all expressed in an accessible printed format. Senior pupils with web design skills would be recruited as 'Pilotlight Developers' to produce a digital version that could be updated as more family information is gathered. The pupils' contributions as co-researchers, co-designers, co-facilitators, and co-authors are the initiative's core objectives. They would thus be acknowledged in all outputs and supported as 'Pilotlight Ambassadors' to organise a promotional presentation and exhibition. Distribution of the book would seek further feedback and participation from the wider Islay community. *Family as Community* celebrates the individual and communal identities distributed throughout Islay by collecting, visualising, displaying, and sharing residents' experiential stories. Furthermore, it proposes a collaborative community project to enrich high school pupils' creative, communication, organisation, and facilitation skills, reinforce their ownership over the initiative, and impart a sense of professional enterprise and cultural pride.

As I elaborate on in chapter four, our student team's collaboration informed the co-creation of the *Islay pre-pack* and *Islay workshop pack*, our facilitation of the workshop, the relationships we formed with the pupils, our evaluation of the tool returns, and my *Family as Community* proposal. Echoing the dual acquisition of information and relationships expressed in the central research aim, these effects highlighted the tools' abilities to discover cultural stories and to strengthen bonds between designers and participants. I left the Islay setting inspired by the social interactions afforded by the playful probes. In response, I selected a contrasting, familiar, and potentially more accessible case study setting to explore my creation and use of increasingly subjective and expressive imagery and stimulate dialogue and decision making with participants.

Case study three: The Mackintosh Building user experience

As I highlight in Fig. 24, in this chapter I primarily concentrate on the evaluation-in-action stage of the Mackintosh Building case study. Following my examination of the building through desk research and participant observation, I outline how I repackaged my experiential drawings as an interview prompt to gather staff members' insights surrounding GSA's tour service and visitor needs (Port-MBop). I then detail phases of mapping opportunities, constructing prototypes, and evaluating these with the staff. As the conclusion of this stage, I made a new collection of tools and techniques to question design students' experiences as users of the building (Port-MBe).

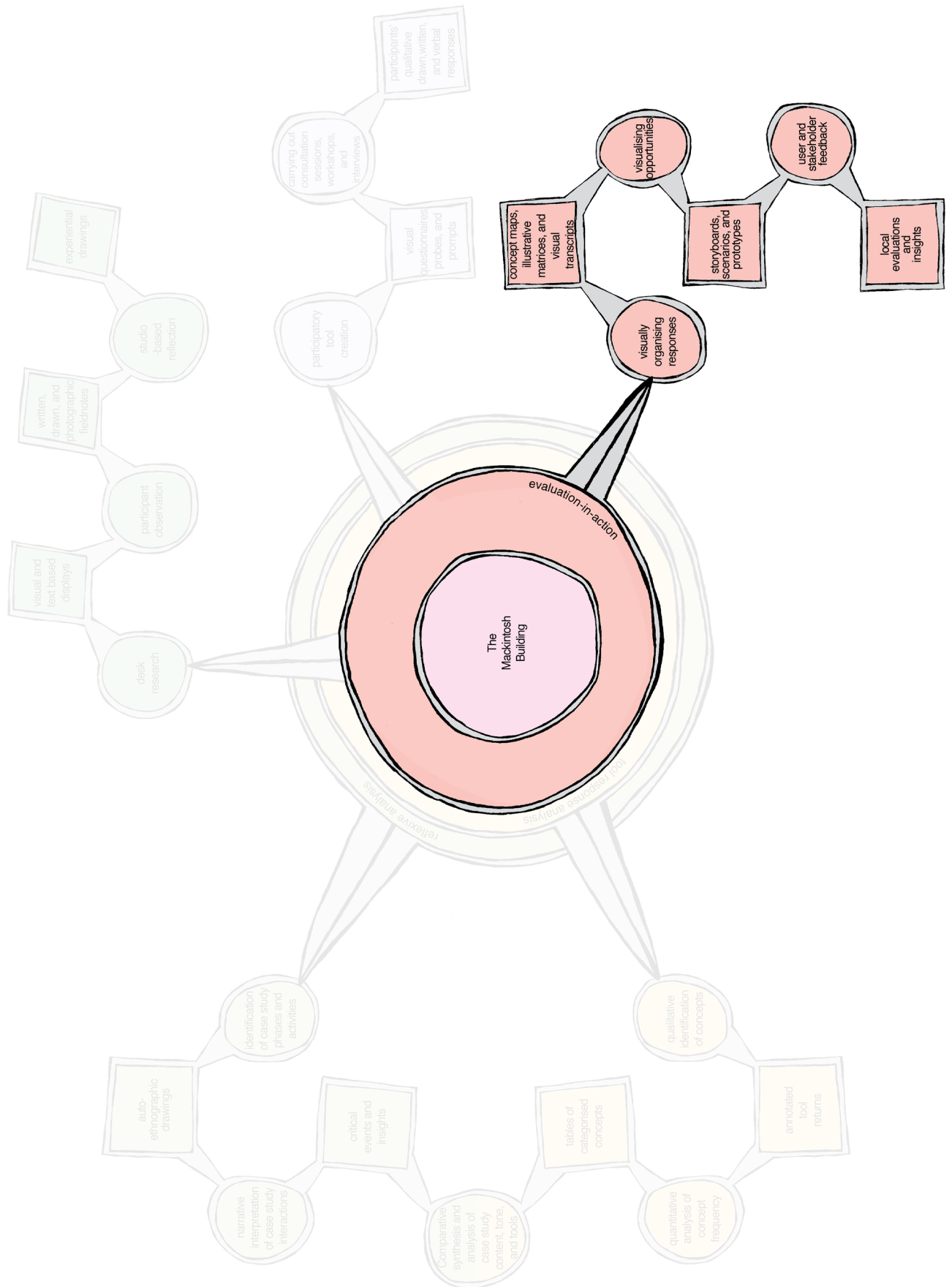


Fig. 24. Cara Broadley (2013) *Using my five-stage participatory-reflexive methodological compass 3: evaluation-in-action in the Mackintosh Building case study* [diagram]

The Charles Rennie Mackintosh Building at GSA functions as an academic institution and iconic architectural landmark, encompassing students, staff, and visitors as users. This inspired my selection of GSA as a context to investigate organisational placemaking and to test how my participatory-reflexive methodology could establish design-led participation across the school. I scoped the GSA setting, noting emergent information in my hand-drawn sketchbook map, *Visualising the Mackintosh Building desk research* (Port-MBo). The buildings adjacent were demolished in 2011 to make way for a new School of Design. In the meantime, its staff and students had temporarily relocated to *Skypark* – a commercial building located one mile west of GSA's main campus (Miller, 2011). Promoting visitor access amidst the construction work, GSA Enterprises train students and graduates as tour guides to conserve the fabric of the Mackintosh Building and sustain its primary use as a working art school (The Glasgow School of Art, 2013c).

As a design student based in a different building, I adopted the role of a participant observer on five public tours to experience the Mackintosh Building from a visitor perspective and critically evaluate the tour service. I used writing and drawing to document the guides' spoken commentaries, visitor demographics, movements, questions, and comments, as exemplified in my *Observational fieldnotes* (Port-MBo). Later in the studio, I noted patterns originating from my observations through making the *Mackintosh Building experiential drawings* (Port-MBo). In ten collages, I visualised the phases of the tour and the multiple layers of information presented by the guides to link the sensory spectacle of the building with visitors' movements. I interrogated visitors' actions and gestures in fourteen line drawings. Here, I conveyed observations of visitors touching the building's decorative features, exploring its corridors independently of their tour group, and taking interior photographs, thus breaking the rules set out by the guides in the tour introduction. In eight watercolour collages, I represented interactions between visitors, students, and staff. I visualised areas of the building as a landscape accommodating digitally drawn characters, with speech bubbles and text boxes contributing an additional level of narrative. I made six diagrammatic drawings to

assess foreign visitors' behaviour and the problems imposed by language barriers. I also photographed customised LEGO figures as actors situated against the building backdrop. By contextualising these scenarios with interpretative written profiles, I speculated on the needs of the building's diverse user groups and emphasised potential problems arising from the tour format.

I arranged to carry out a semi-structured interview, *Building Experiences 1*, with GSA Enterprises' Tours Assistant and fine art graduate (TA) and General Manager (GM) to gather their insights and consider collaborative opportunities for enhancing the visitor experience (Broadley, 2011m). In preparation, I designed a logbook – *Building Observations: investigating the visitor service and user experience of The Mackintosh Building in The Glasgow School of Art July–November 2011* – to use as a visual prompt (Broadley, 2011l). Mimicking the familiarity of the sketchbook and evoking my roles as a student user and design researcher, I positioned the *Mackintosh Building experiential drawings* on ruled blue lines, captioned them with titles, and hardback spiral-bound the pages (Port-MBp – a full copy can be found in the pocket at the end of this portfolio book). Two weeks prior to the interview, I gave GM and TA each a copy of *Building Observations* and a packet of *Mack-it notes*. Juxtaposing the ubiquity of sticky notes with the emotive qualities of graphic elicitation tools discussed in chapters one and two, these paper squares feature an illustration of myself asking a series of questions surrounding their experiences of working in the building on one side, and a blank speech bubble on the reverse (Wall et al., 2005; Loxley and Prosser, 2008: 30; Brown, 2009; Macdonald et al., 2010; Burns, 2011; The Design Council, 2013). I asked GM and TA to examine *Building Observations* and the questions, write their responses on the *Mack-it notes*, and attach them next to related drawings (Broadley, 2011k; Port-MBp). This combination of tools allowed our exploratory conversation to be structured by my drawings and questions, but led by the stakeholders' local knowledge.

Focusing on user groups, tour aims, rules, guides, and the building itself, I transcribed the interview, located discussions of these themes, organised statements into problems, opportunities, insights, and needs, and consolidated

these in *The Mackintosh Building visual transcript: exploring The Glasgow School of Art tour service and Mackintosh Building user experience* (Port-MBe – a large format version can be found in the pocket at the end of this portfolio book).

By drawing coloured arrows to connect illustrations and text, I convergently transcended the initial phase of insight gathering to propose a strategy for a more inclusive visitor experience. With reference to my depictions of foreign visitors on the tours, we approached issues of access and communication. GM criticised the format of their translation sheets and TA added that a more engaging version was currently being designed. I asked how foreign visitors' feedback was collected and they explained that GSA Enterprises' form is mostly completed by English speakers (Broadley, 2011m; App-MBe). Making and reflecting on *The Mackintosh Building visual transcript* drove me to design three visual multilingual devices to reevaluate foreign visitors' experiences and aspirations.

I employed the existing feedback form as a starting point to design *Prototype foreign visitor feedback tool 1*, creating pictograms to graphically symbolise the questions and engage visitors with varying fluencies in English (Port-MBe). Don Norman maintains that pictograms convey meaning more inclusively than text, while Charles Tijus, Javier Barcenilla, Brigitte Cambon de Lavalette, and Jean-Guy Meunier concede that the user's interpretation of these stylised symbols is not always as their creator intended (Norman, 1990; Tijus et al., 2007: 18). By including the original textual questions alongside the pictograms, I aimed to improve foreign visitors' reception of the feedback form and provoke their responses. I positioned the questions in sections and added a stylised drawing of Charles Rennie Mackintosh as a covering image. Further spaces and symbols would encourage visitors to comment on the ticket price, the information provided, their tour highlight, and any other positive and negative elements. Visitors would be introduced to the form as their tour culminates and asked to respond by writing in their preferred language. GSA Enterprises and myself would deal with translation into English at a later date.

I then proposed a less structured format to invite visitors to share their experiences descriptively. *Prototype foreign visitor feedback tool 2* develops the visual tone of the *Mack-it notes*. I re-photographed my LEGO visitors standing outside the Mackintosh Building's main entrance, created a corresponding version of the architect himself, added empty speech and thought bubbles, and placed these images onto postcard templates (Port-MBe). On the reverse I included an edited selection of questions and pictograms and a blank space for extra comments. Visitors would post their completed cards into a box temporarily installed in the GSA shop.

I appropriated playful participatory techniques to collect visitors' experiences in designing *Prototype foreign visitor feedback tool 3*. I made a cartoon-like mask of Charles Rennie Mackintosh's face and neck from plywood, painted it grey, drew happy and unhappy expressions on each side, and designed moustache-shaped cards. After recording their tour highlights and any low points through writing, visitors would hang their cards on the positive and negative sides of the mask template. I would then photograph visitors behind this personalised Mackintosh disguise to document their feedback (Port-MBe).

In a second interview, *Building Experiences 2*, an MDes student accompanied me to make a video recording of my conversations with GM (Broadley, 2012a). The prototypes' material presence underpinned our verbal critique of their applications and usefulness (Brown, 2009: 89–90; Hanington and Martin, 2012: 138). In this, GM showed resistance to the style of my imagery and was reluctant to implement participatory methods with adult visitors:

A lot of the feedback that we get shows that this is something that they have wanted to do their entire lives and it's a very serious experience and they've read about the building since they were kids and this is the pinnacle of their visit to Glasgow, so it needs to be done in quite a serious way and we take our visitor feedback really, really seriously. So I think for kids, to kind of encourage participation through props and things, that's fine, but I think for adults...there would obviously be a big group who would think that these are great and have fun and things, but

again, its not really the sort of tone that we would go for.

GM in Broadley, 2012a

The tone of my tools continued to clash with the serious nature of the tours. GM had reservations over my drawings of Charles Rennie Mackintosh in *Prototype foreign visitor feedback tool 1* and *Prototype foreign visitor feedback tool 2*, expecting them to be deemed inappropriate by the director of GSA. I attempted to strengthen collaboration by encouraging her to suggest alternative images, at which point GM advised that the GSA Enterprises team amend my digital artwork (Broadley, 2012a). I explained that altering the feedback tools without my visual input was outside the bounds of my research (Broadley: 2012b).

This session yielded insightful data in spite of its difficulties, and I returned to *The Mackintosh Building visual transcript* to identify further opportunities surrounding the case study setting. In the first interview, when I asked if guides were typically fine art students with a background of working in the Mackintosh Building's studios, TA elaborated on the pivotal role of the building in all students' lives and positioned the campus shuttle bus as a primary means of sustaining this relationship:

It varies in each year but I think the school is keen for everyone to have an experience of this building. I know that the architecture students don't study in this building but they do quite a lot of projects in this building, I mean, it's called the Mackintosh School of Architecture, and I know that one of the major reasons for the shuttle bus is so that the students at Skypark have that connection. I think the school believes that it is important that all the students have a relationship with this piece of architecture.

TA in Broadley, 2011m

The Mackintosh Building visual transcript evidences my interpretations of TA's comments in parallel with my own limited encounters with the building, namely to submit administrative forms to the academic registry or finance department, or to

occasionally attend lectures. The transcribing and mapping phases allowed me to adjust the focus of the case study to explore other design students' perceptions, uses, and experiences of the Mackintosh Building, how the School of Design's decant to Skypark had impacted upon this relationship, and ways that this could be enhanced and improved (Port-MBe).

Progressing from participation towards collaborative idea generation, I designed a poster to recruit students for a co-design workshop (Steen, 2011: 52; App-MBe). Nine students attended: three MDes Innovation students, five first year Fashion and Textiles Design, Silversmithing and Jewellery Design, Product Design, and Communication Design students, and the student president and Ceramic Design graduate (Broadley, 2012c). The *Building Experiences 3* workshop photographs illustrate the tools and techniques applied in each phase (Port-MBe). Appropriating sticky notes to externalise existing experiences, our workshop began with a brainstorming activity to evaluate students' perceptions and uses of the Mackintosh Building, Skypark, and the wider campus. To stimulate reflection on these encounters, the students then mapped their interactions with spaces, people, artefacts, and technologies by drawing user journey matrices on large blank sheets of paper. Following this, they expressed their emotional connections to the Mackintosh Building by writing collaborative 'break-up letters' or 'love letters', and constructed personas of their targeted users by annotating blank GSA matriculation card templates (Hanington and Martin, 2012: 114, 132, 196). They then presented these artefacts to the collective group as their redefined brief. Reassembling problems, opportunities, insights, needs, and themes, the students sketched prototypes and storyboards to visualise the ideal building experience (Brown, 2009: 87–95; Macdonald et al., 2010; Burns, 2011; Hanington and Martin, 2012: 138, 170; The Design Council, 2013). As I analyse in the next chapter, both groups' proposals addressed a physical disconnection between fine art and design departments at GSA and the need to reconsider the effectiveness of its online 'Virtual Learning Environment' resource (The Glasgow School of Art, 2013d; Port-MBe).

My diverse interactions with GSA, its visitors, staff, and students advanced my research aims to investigate designers and participants' relationships, and images and artefacts as methodological tools and techniques. The familiarity and accessibility of this case study setting and my multifaceted position as a designer, illustrator, researcher, and PhD student at GSA deepened my inquiry into how designers' manage and adapt to different roles in practice-led human-centred design research. In the following analysis chapter I go on to unpack the insights I discovered from the participants' responses and the implications of using my own images and artefacts in the human-centred design process.

FOUR

Unpacking case study journeys: analysing participants' responses and reflexive interactions

As is highlighted in Fig. 25, in this chapter I focus on the fourth and fifth stages of my participatory-reflexive methodological compass. I systematically interrogate the Rothesay, Islay, and Mackintosh Building case studies individually to synthesise the collected data and develop my corresponding analytic procedure. As in the previous chapter, the reader should refer to the three portfolio books, *Case study 1: Rothesay Townscape Heritage Initiative*, *Case study 2: Island wellbeing in Islay*, and *Case study 3: The Mackintosh Building user experience*, and the volume of appendices when the coloured codes are indicated (Port-R, Port-I, Port-MB; App-R, App-I, App-MB).

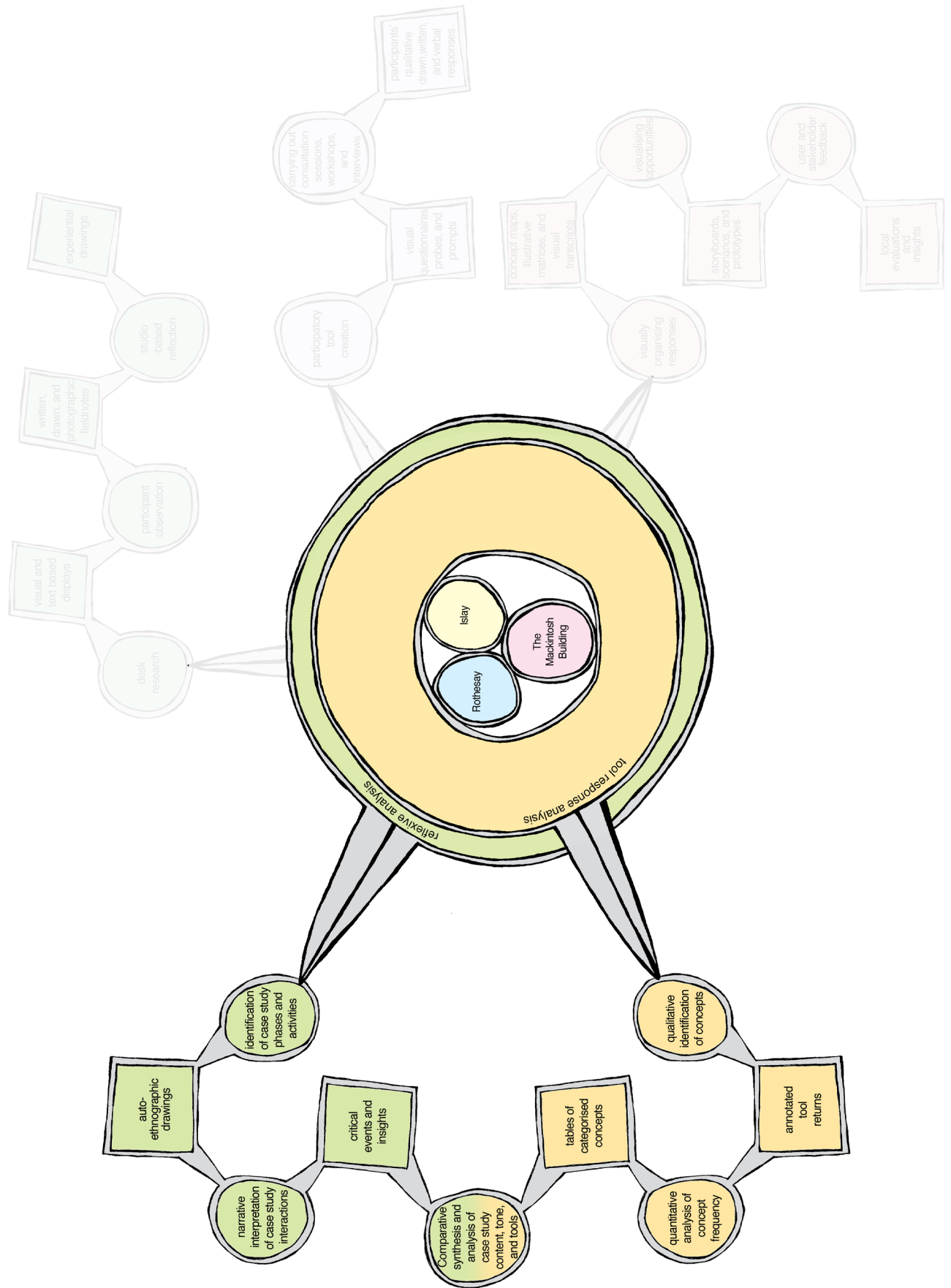


Fig. 25. Cara Broadley (2013) *Using my five-stage participatory-reflexive methodological compass 4: tool response analysis, reflexive analysis, and comparative analysis of case study data* [diagram]

case studies	Rothesay		Islay	Mackintosh Building		
interactions	community consultation focus group 1 (Broadley, 2011d)	community consultation focus group 2 (Broadley, 2011f)	participatory workshop (Broadley et al. 2011)	interview (Broadley, 2011m)	feedback interview (Broadley, 2012a)	co-design workshop (Broadley, 2012c)
date	23/04/11	11/06/11	17/11/11	12/12/11	30/3/12	22/5/12
local objectives	<ul style="list-style-type: none"> to explore residents' experiences, needs, problems and aspirations 	<ul style="list-style-type: none"> to gather residents' feedback on the prototype's desirability 	<ul style="list-style-type: none"> to explore pupils' perceptions of island identity and wellbeing 	<ul style="list-style-type: none"> to explore the tour service and visitor experience at GSA 	<ul style="list-style-type: none"> to gather staff's feedback on the prototypes' applications and usefulness 	<ul style="list-style-type: none"> to explore the design student experiences of the Mackintosh Building
research objectives	<ul style="list-style-type: none"> to instigate drawn and written dialogue in community consultation through sharing text and images 	<ul style="list-style-type: none"> to instigate verbal dialogue via my own images and artefacts 	<ul style="list-style-type: none"> to instigate cultural storytelling via my own images and artefacts 	<ul style="list-style-type: none"> to identify problems, opportunities, insights, needs, and themes via my own images and artefacts 	<ul style="list-style-type: none"> to instigate verbal dialogue via my own images and artefacts 	<ul style="list-style-type: none"> to generate insights and ideas collaboratively through sharing images and artefacts
participants and collaborators	42 Rothesay residents, 6 GSA MDes Innovation students (2010-2011 cohort), THI Project Officer and Community Development Officer (PO and CDO)	10 Rothesay residents, THI Project Officer and Community Development Officer (PO and CDO)	5 GSA MDes Innovation students (2011-2012 cohort), 32 Islay high school pupils, head teacher and principal technology teacher	GSA Enterprises General Manager and Tours Assistant (GM and TA)	GSA Enterprises General Manager (GM)	9 GSA undergraduate and postgraduate design students (2011-2012 cohort)
tools	<i>Visual questionnaires</i>	<i>Haste ye Bute prototype</i>	<i>Islay pre-pack and Islay workshop pack</i>	<i>Building Observations log book and Mack-it notes</i>	<i>Prototype foreign visitor feedback tools 1, 2, and 3</i>	<i>sticky notes, user journey matrices, love letters, break-up letters, profiles, storyboards, and prototypes</i>
location in portfolio & appendices	Port-Rpt App-Rpt	Port-Re App-Re	Port-lpt App-lt	Port-MBpt App-MBt	Port-MBet App-MBt	Port-MBet App-MBt
every possible step was taken to gain participants' consent to include and discuss their drawn, written, and verbal comments throughout the thesis and portfolio						

Fig. 26. Cara Broadley (2013) *Case study facts* [table]

In Fig. 26 I present a fact table to aid the reader's navigation throughout this chapter in respect of the case study interactions, my objectives, the involved participants and collaborators, the related tools, and the location of these images and artefacts in the portfolio and appendices.

Through tool response analysis, I begin by aggregating and annotating the *Visual questionnaire* returns, *Islay pre-pack* and *Islay workshop pack* tools, completed *Mack-it notes*, transcript pages from the *Building Experiences 1* and *Building Experiences 2* interviews, and the *Building Experiences 3* workshop tools to qualitatively locate emergent concepts. I position these within categories in a series of tables to quantitatively determine the dominant thematic patterns of information arising from participants' drawings, writings, and speech. This stage corresponds to the central research aim and allows me to assess how the tools progressed the phases of human-centred design exploration to reveal participants' local knowledge.

Developing this aim to understand how my own practice can strengthen my interactions with participants, and deepening my examination of the research question – *which aspects and attributes of visual and participatory tools and techniques support designers in balancing their own subjectivity with the experiences and needs of participants* – I then employ reflexive analysis to evaluate the extent to which the tools supported understanding, empathy, rapport, consensus, and dialogue as the key modes of engagement. I visually identify the phases and activities comprising each case study through making the autoethnographic drawings, and use variations of scale and layout in the portfolio to distinguish between critical events and less significant instances. These descriptive accounts lead to subsequent experiential insights: realisations that my creation, use, and interpretation of each tool at a local level influenced my interactions with participants, the relationships we formed, and my own role as the central designer and researcher.

The chapter's conclusion provides a holistic space in which I layer the insights uncovered through these two modes of analysis. I define and correlate specific cultures of design participation with the particular aspects and attributes of my tools and techniques and assess their strengths and weaknesses in these specific contexts. This corresponds with the research's focus on the methods designers use to interact with user and stakeholder participants, elicit information, and enrich productive human-centred design relationships.



Rothesay tool response analysis: annotation, interpretation, aspiration, regeneration

As discussed in chapter three and summarised in the table in Fig. 26, I engaged with the Rothesay residents attending the first community consultation focus group to investigate their experiences of living in the town and their opinions of the THI. Of the 42 residents I introduced to the *Visual questionnaires*, 29 were keen to interact with the materials and spent time expressing their feelings and ideas. Seven residents responded through writing and drawing on the images as I had intended, fifteen chose to write their answers beneath the flap beside the questions, and the remaining seven residents did both (Broadley, 2011d). I examined the residents' responses, annotated each completed *Visual questionnaire*, and aggregated these pieces of data as concepts into a refined set of categories. App-Rt shows the returns analysed during this phase. Blue sticky notes represent the working categories I extrapolated from the residents' writings and drawings, which I respectively translated and interpreted from the concepts circled in red. As the returned tools are saturated with layers of residents' drawings and text, and concepts often span more than one category, in the following analysis my direct reference to specific *Visual questionnaires* provides exemplar responses and is thus not exhaustive.

Residents annotated the *Visual questionnaires* to advocate the promotion of local foods and crafts in the town's disused shops (App-Rt, fig. 1). This notion was extended to suggest the introduction of community-based information boards and outdoor seating to enhance social interaction in Rothesay's streets. These concepts formed the *community events* category. Meanwhile, the residents' ideas to restrict traffic in the town centre pointed towards *infrastructure and access* as a second category (App-Rt, figs 1–2).

Exemplifying the *dereliction, decay and neglect* category, residents expressed their views that Guildford Square and the gap site represent a general lack of investment in Rothesay and symbolise its run down appearance (App-Rt, fig. 2). Transmitting the concept of architectural gaps into the social realm, residents stressed feelings of disconnection amongst older and younger generations and classified these distinct groups in relation to the areas of the town where each typically congregate. I conceptualised residents' discussions of an impaired sense of community within the *social segregation* category (App-Rt, fig. 16). Despite emphasising these negative aspects of the town, residents alluded to a future vision of Rothesay with the community at its heart, thus contributing to the initial *community events* category.

I developed two additional categories to contain concepts surrounding Rothesay's image as a place of cultural significance. The *heritage, nostalgia and identity* category accounts for residents' recognition of Rothesay's past, particularly in terms of its Victorian architecture and former reputation as a leisure town (App-Rt, figs 2–9). In spite of this, residents complained that insufficient maintenance of decorative architectural features perpetuates Rothesay's environmental and cultural decline. A low level of pride over the town's image was at odds with Guildford Square's central position as a pivotal meeting place. Such comments permeated the responses and reflected residents' aspirations to reinterpret *the gap site and Guildford Square as a community hub*, positioning this as a further category (App-Rt, figs 22–23). Concepts of grandeur, history, and iconicity were elaborated on in the *Visual questionnaire* returns and populated the *heritage, nostalgia and identity* category (App-Rt, fig. 9). This *Visual questionnaire* also evidenced the seventh and final category: *the visitor experience*. Many residents acknowledged that the town does not cater effectively for tourists, in terms of both information and activities. In response, they recommended an increased focus on promotional material, noticeboards, and integrating tourism with community events (App-Rt, figs 9–11).

number of questionnaires returned	category	concepts identified from <i>Visual questionnaires</i>	frequency	rank
29	dereliction, decay and neglect	negative appearance of the town lack of investment, a wasted opportunity, ugly, awful, bad first impression, eyesore, rundown, empty, horrible, boring, abandoned, rust, cables, cheap signs, scruffy, fading	37	2
	infrastructure and access	enhancing the use and feel of the town, close this road, get rid of the carpark, extend the piazza, no cars, redesign of traffic flow to enhance shopping areas	13	7
	the gap site and Guildford Square as community hub	accessible and a centre of activities, new meeting place, trampolines, sand pits, grouped seating, shelter, art, stage, craft market, farmers market, flowers	32	3
	community segregation	disconnection between resident groups, intimidated by younger people, nothing to do, generation gaps, activities for the young AND old, all ages together, drunk, upsetting, men peeing, too complex, us and them	20	6
	community events	aspirational improvements, music venue, open-air market, outdoor activities, craft shop, cafe, food, arts space, outdoor seating, festival, fete, what's on board, young people volunteering	21	5
	heritage, nostalgia and identity	positive appearance of the town, Victoriana, best asset, grandeur, iconic, distinctive, unique, contrast, old, memory, bandstand, castle, museum, seaside, tartan, ice cream, lampposts, mosaic, ironwork, royal, Rothesay blue	46	1
	the visitor experience	ideas to attract visitors, ferry, fact sheet, guides, maps, seasonality, timetables, information boards, visitors bypassing the town, where to go, more things to do	31	4

Fig. 27. Cara Broadley (2012) *Conceptualising Rothesay residents' experiences, problems, needs, and aspirations from the Visual questionnaires* [table]

I assessed the frequency of concepts situated in these categories within and across the residents' drawn and written responses and present these findings in the table shown in Fig. 27. Their varied nature spanned the returned *Visual questionnaires*. 24 residents shared their experiences and opinions of the town and complemented these with ideas for Rothesay's future. In five returns, however, residents revelled solely in reiterating Rothesay's problems. I therefore considered the three highest-ranking categories as memories of Rothesay's past (*heritage, nostalgia and identity*), expressions of its present (*dereliction, decay and neglect*), and its community's optimistic aspirations for a brighter future (*the gap site and Guildford Square as community hub*). Followed closely by ideas to enhance *the visitor experience*, the table's assimilation of the participants' insights echoes my early objective to reinterpret Rothesay as a vibrant tourist destination whilst meeting the diverse needs of its residents.

Recalling my case study descriptions in chapter three, this synthesis and analysis of qualitative and quantitative data develops my extraction, interpretation, and illustration of residents' insights in the *Rothesay responses concept map* in evaluation-in-action. In the second community consultation focus group (Broadley, 2011f), I presented my *Haste ye Bute prototype* to initiate further discussion with residents and to evaluate the proposal's feasibility and desirability (*Port-Re; App-Re*; see Fig. 26). Drawing from these conversations and the broader phases and activities of the Rothesay case study, I examine the social interactions that occurred and elaborate on the insights that these revealed in the following reflexive analysis.



Rothesay reflexive analysis: visiting, visualising, consulting, conflicting

The first community consultation focus group was a critical event. My interactions with the residents demonstrated the *Visual questionnaires'* abilities to encourage our visual articulation and exchange of experiences. The two female residents shown in drawing 29 appreciated being asked familiar questions in a new way and said that 'these are exactly the same questions we keep asking ourselves' (Rothesay resident 1 in Broadley, 2011d; Port-Rr). Their comments suggested that the tools visually translated my understandings of local issues from a visitor's perspective to establish mutual empathy. The *Visual questionnaires* were the protagonists in this act. Their unfinished drawings and open-ended questions broke the ice in the consultation session. Evidenced by our convivial expressions while conversing, the tools forged a sense of rapport and consensus as the residents and myself externalised our individual aspirations for the town.

Drawings 24 and 25 signify the difficulties of maintaining consistent collaboration with all six MDes students due to the team's conflicting commitments. Our physical distance in the studio led to a lack of cohesive visual identity across our data collection tools and duplications in the questions they asked (Port-Rr). As a series of critical events, this unstable collaboration contributed to some residents' resistance in the first consultation session. Hindered by a disjointed spacial arrangement of disparate artefacts and activities, the female resident foregrounded in drawing 30 professed that she did not have time to complete the *Visual questionnaires*, before proclaiming at length that the town's emptiness enhances its peacefulness. Refusing to participate through writing or drawing, the central resident shown in drawing 31 complained that despite the THI's extensive

community consultation, physical improvements were yet to be made. Two residents overheard his dissatisfaction and cited the THI's impenetrable decision-making process as preventing their active involvement in the town's regeneration (Broadley, 2011d; Port-Rr). United on one side of the frame by their consensual reservations, the *Visual questionnaires* operating as my defence barrier, I initially perceived these residents' comments as a personal attack on myself as an outsider. My drawn autoethnographic reflection, however, illuminated that the tools' suggestive yet inquisitive material qualities empowered the residents to project their opinions of the town verbally. These two insights – the residents' engagement with and rejection of the tools – reinforced the THI as a divisive and contentious issue amongst the local community.

Critiquing the *Haste ye Bute prototype* in the second consultation focus group, the female resident in drawing 38 acknowledged my visualisation of visitors' and residents' requirements as 'a really thoughtful perspective on lots of micro problems' (Rothesay resident 2 in Broadley, 2011f; Port-Rr). In this critical event, consensus was stimulated as we considered how residents could direct their own regeneration initiatives by creating a community-led guidebook to share local stories. A resident from the first session approached us and conceded that *Haste ye Bute* could revitalise Rothesay, but that 'the hardest part will be getting the community involved in the first place' (Rothesay resident 3 in Broadley, 2011f; Port-Rr). Indeed, echoing the social inactivity I had witnessed in the town during participant observation in drawings 6–11, low attendance rates at both sessions limited my opportunities to interact with a broader cross section of the community. This uncovered a further insight and need to interrogate how the THI engages with residents who may not be inclined to attend such events, and how their responses might differ.

Discussing the intervention's benefits in drawings 39 and 40, CDO noted various logistical constraints and attributed some residents' hostility to 'consultation fatigue' (Broadley, 2011g; Port-Rr). My reflexive interpretations infer that the consultation session was flawed from the outset: Rothesay needs less talk and more action.

This critical event mediated an overarching local insight that while consultation is perceived as a democratic element of placemaking, community disengagement remains a complex hurdle. Profuse attempts to enlist participation can result in feelings of reluctance and resentment.

The drawings, writings, and verbal dialogue afforded and accumulated by the *Visual questionnaires* and the *Haste ye Bute prototype* exposed residents' conflicting positive and negative attitudes. As I go on to discuss later in this chapter, my development of tools and techniques across orientation, participation, evaluation-in-action, tool response analysis, and reflexive analysis informed the differentiation of residents as aspirational drivers of community involvement and environmental regeneration on the one hand, and those who expressed a distrust of our MDes and PhD student design team, a reluctance to participate, and a degree of apathy towards to THI on the other. The amalgamation of visual expression and representation, participant engagement, intuitive evaluation, and rigorous analysis of our collective responses advances the five-stage participatory-reflexive methodology as a holistic strategy for designers to gather and understand data as sociocultural insights.



Islay tool response analysis: story, family, identity, community

The Islay high school pupils were chosen for the participatory workshop due to our team's desk research focus on Islay's heritage, residents' perceptions of its cultural identity, and the role of children and teenagers in shaping the island's future (Broadley et al., 2011; see Fig. 26). As I set out in chapter three, evaluation-in-action allowed me to locate patterns, insights, and opportunities to inspire the *Family as Community* proposal (Port-le). To verify that these interpretations were based on concepts discussed by the pupils and to develop my analysis of thematic patterns within their responses, I began tool response analysis by sorting the 31 completed *Story postcards* returned in the pupils' *Islay workshop packs*. I then identified concepts from their drawings and writings and interpreted these as belonging to *local myths and legends*, *personal experiences*, and *family stories* as three initial categories (App-It, figs 1–3).

number of story postcards returned	category	concepts identified from <i>Story postcards</i>	frequency	rank
31	local myths and legends	history, cultural heritage, landmarks, origins, entities	19	1
	personal experiences	memories, encounters, skills, abilities	5	3
	family stories	ancestry, family members, achievement, discoveries, occupations, events, celebrity, fame, identity	6	2

Fig. 28. Cara Broadley (2012) *Conceptualising Islay pupils' stories from the Story postcards* [table]

The table in Fig. 28 is dominated by concepts of personal heritage and family identity derived from the pupils' imaginative and anecdotal stories. Pursuing this line of inquiry, I recognised references to family across their remaining *Islay pre-pack* and *Islay workshop pack* tools and reconstructed the pupils' drawings and writings as concepts and categories. Forming the *diverse family units* category, the profile card returns revealed that eight pupils lived with a single parent, 24 resided in a household with both parents, pupils had between one and three siblings, three pupils lived with their grandmothers, and fourteen pupils listed their family pets (App-It, fig. 4).

Upon inspecting the returned *Islay playing cards*, I found that sixteen pupils had highlighted their *family members as heroes or idols* (App-It, fig. 5). This category reinforced the role of family in island communities and pointed towards an opportunity to integrate the pupils' relatives as collaborating community champions. In contrast, five pupils considered their own or their friends' *siblings as island dislikes* by jokingly disposing of a brother or sister 'in the bin' (App-It, fig. 6). I questioned the pupils' future goals with support from the returned *Magic cameras*. These tool returns illustrate eight pupils' use of writing, island drawings, and arrows to indicate their desires to continue living on the island after leaving school, making up the *future on Islay* category. Pupils' aspirations to follow career paths with links to Islay's agricultural industry were apparent throughout the returns and suggested that these plans may have connections to their parents' occupations, as the remainder of the *Islay playing cards* in this category suggested (App-It, fig. 7).

number of tools returned	category	concepts identified from <i>Islay pre-pack</i> and <i>Islay workshop pack</i> tools	frequency	rank
337	family members as heros and idols	parents, mum, dad, grandparents, brother as response to <i>Islay playing cards</i>	16	2
	diverse family units	single parent families, both parents, single child, one – three siblings, grandmothers, dogs, cats, fish, chickens, ducks included in profiles	73	1
	family stories	achievement, celebrity, family members, fame, discoveries, occupations, events conveyed in <i>Story postcards</i>	6	4
	future on Islay	Islay, farming, farmer, drawing of island outline, arrow pointing to island on card, drawings of agricultural equipment, desire to work in distillery in <i>Islay playing cards</i> and <i>Magic cameras</i>	16	2
	impact of distilleries on island community	correct identification of distillery locations on map posters, whisky packaging returned an island souvenir in envelope	10	3
	siblings as island dislikes	brother or sister as response to litter bin task	5	5

Fig. 29. Cara Broadley (2012) *Conceptualising notions of family present in pupils' Islay pre-pack and Islay workshop pack returns* [table]

After the workshop, the principal technology teacher concurred that the pupils have extensive knowledge of Islay's whisky industry because most have a family member working in one of the eight distilleries (Broadley, 2011j). As such, one pupil signified this as their career goal, seven pupils correctly located the distilleries using the island map posters and stickers, and two returned an embossed metal lid and small booklet from *Laphroaig* whisky containers in their *Islay pre-pack* envelopes. These strands of interconnected data affirmed the pupils' recognition of the whisky industry and implied how this traditional aspect of Islay's culture and economy contributes to its current identity and unites its community (the *impact of distilleries on island community* category, *App-It*, fig. 8).

Mirroring my *Islay responses data evaluation matrix* created during evaluation-in-action, the table in Fig. 29 supports my focus on gathering further data to transmit family portraits across and beyond the island in the *Family as Community* proposal. Informed by my identification of family as a core concept within the pupils' tool responses, this sought to enhance community wellbeing by uniting distinct groups of residents and celebrating Islay's rich heritage and contemporary culture. The presence of collaborative tool creation and my positioning of the pupils as co-researchers and co-designers in the proposal was inspired by our team's joint production of the tools and the pupils' interactions with these materials. Upon our arrival, we discovered that just three of the 32 pupils had completed their *Islay pre-pack*. However, and as I go on to develop through my narrative interpretations of the *Islay autoethnographic drawings* (*Port-Ir*), by verbally facilitating their participation in the workshop, we collected 337 of a possible 480 completed individual tools. These responses shared the pupils' subjective experiences of Islay, voiced their personal opinions, revealed local problems, and expressed their future aspirations (Broadley et al., 2011). Accounting for the presence of drawn, written, and verbal communication across the case study, I use reflexive analysis to examine the effect of my visual tools and techniques on these human-centred design relationships.



Islay reflexive analysis: storytelling, sharing, playing, proposing

Supported by our student design team's collective desk research visualisations, studio-based discussion and modification of the *Islay pre-pack* and the *Islay workshop pack* in drawings 9–14, 17, 18, and 20 prompted a critical arrangement of events that progressed our consensual understanding of the Islay setting (*Port-Ir*). Our familiarity with the tools through exchanging onscreen visuals, handling printed prototypes, and constructive verbal critique strengthened rapport in our working relationship.

The participatory workshop's structure was aided by the *Islay workshop packs'* modular nature and its components subsequently fostered the pupils' sustained engagement. In drawing 25, I recalled two female pupils playing games with the *Islay playing cards* and taking imaginary photographs with the *Magic cameras*. One pupil assumed that the workshop was an end-of-term reward while another, seen in drawing 28, asked to take his drawings home to show to his mother (Broadley et al., 2011; *Port-Ir*). Developing the previous insight that collaborative tool creation established designerly relations, the proximity of the actors in each composition and the graphic and spatial interplay of our faces, hands, and the tools attributes the camaraderie and rapport permeating these interactions partly to the *Islay workshop pack's* playful and bespoke appeal.

I interpreted the development of my *Story postcard* as a collection of minor instances comprising a major critical event that directed the case study, the relationships that I formed with the pupils, and the outcomes I proposed in

evaluation-in-action. As I set out in chapter three, listening to my mother recount her grandmother's anecdote in drawings 7 and 8 drove my phase of gathering experiential stories to gain a cultural understanding (Broadley, 2011h). Recorded in the domesticity of my childhood home and grounded in my family history, her narrative reduced the literal and metaphorical gaps separating me from Islay, while my instincts as a visualiser triggered my illustrative translation shown in drawings 15 and 16. By relaying the tale to the pupils in a storyboard/postcard format and through a cartoon-like tone, I began to build an empathic connection in preparation for our workshop (Port-Ir). Drawing 23 highlights the pupils' lack of *Islay pre-pack* returns, yet in drawing 26, they listened intently as I recited the story colloquially. Unpacking the previous insight that engagement can be stimulated by the designer's externalised subjective knowledge, my combined visual and verbal storytelling propelled the pupils' completion of the blank *Story postcards*.

Our facilitation subtly prompted the less confident pupils to participate verbally, developed their conceptual thinking, cemented the value of their experiences, and encouraged them to transfer these thoughts onto paper. The female pupils depicted in drawing 27 sought inspiration from each other before challenging our design team to narrate parallel personal stories (Broadley et al., 2011; Port-Ir). In doing so, we fostered the pupils' trust and reciprocation. In drawing 24, I positioned myself as an emotionally sensitive, empathic designer.

The *Islay pre-pack* and the *Islay workshop pack* strengthened our engagement with the pupils, not simply by helping us collect their written and drawn accounts of island life, but by mediating an insightful dialogue, harnessing a sense of empathy and a sharing of experiences that was underpinned by conviviality and camaraderie. This was advanced by our relaxed and friendly demeanour. We did not behave like the pupils' teachers. Dressed casually and speaking informally, the act of befriending helped us better understand their experiences, needs, problems, and aspirations. As an insight into our positions as critical designers and curious visitors, we became interactive personifications of our probe pack tools: responding to questions, telling stories about our own lives, and refusing to remain passive in our roles as facilitators.

In drawings 31–37 I sifted through the returned tools, interpreting and connecting the pupils' drawn and written concepts indicative of family life (Port-Ir). Whilst being inspired by the community-led guidebook idea I discussed with the Rothsay residents in the second consultation session, *Family as Community* is inextricably linked to my creation of *Rural Legends*, the collaboration of our team, and the pupils' participation. The proposal reconfigures probe creation and use from a participatory human-centred design research method to a means of enhancing wellbeing in itself. Its storyboards visualise the probe packs as supporters of insight gathering, idea generating, and decision making, but their objective here was primarily to empower the pupils as co-creators within their community network. As I detail later in this chapter by layering the results of tool response analysis and reflexive analysis, these critical events underline that insights do not exist as ready-made data waiting to be gathered. Rather, they are intersubjectively formed and shaped by the joint conversation of designers and participants through visual and material tools, as reinforced by the participatory-reflexive methodology's five stages.



The Mackintosh Building tool response analysis: feedback, foreigners, shuttle bus, students

My desk research investigations of the Mackintosh Building tour service led to my selection of GSA Enterprises' General Manager and the Retail and Tours Assistant as the first participant group (see Fig. 26). With their expert stakeholder knowledge of coordinating the tours, GM and TA's written and verbal reflections on the *Building Observations* logbook instigated our discussion of the building's users and our identification of design opportunities (Broadley, 2011l; 2011m). To locate prevalent concepts surrounding the visitor experience, I began tool response analysis by annotating the interview transcript and the sixteen returned *Mack-it notes*. In the portfolio and appendices I present key examples from this categorisation phase and demonstrate our focus on managing visitor groups' needs (Port-MBt; App-MBt).

TA outlined the student guides' responsibilities to contextualise the Mackintosh Building to visitors amidst the construction of the new School of Design (App-MBt, fig. 1). In response to the *Mack-it note* asking 'are any user groups not represented in the images?', she drew from her experience as a former student to assert the knowledge she had amassed since working for GSA Enterprises and recognised the building's diverse user groups. Combatting my representation of the fine art students and its accompanying narrative suggesting the negative impact of visitors, she explicated the tours' purpose to balance different building users' requirements (App-MBt, fig. 2). GM and TA then acknowledged the guide groups' broad demographic and the relationship between the wider student body and the Mackintosh Building (App-MBt, fig. 3). These insights positioned the *builders, guides, students*, and the various *departments* spanning the school's

management and maintenance as categories. Responding to the problems connoted by my drawings, GM and TA explained that they were in the process of purchasing portable gallery stools for *elderly visitors*, developing a bespoke tour for *visitors with specialist knowledge* of Charles Rennie Mackintosh and his architecture, devising a new activity for *children as visitors*, and improving the translation sheets offered to *foreign visitors* (Broadley, 2011m). I employed these user groups as categories and accounted for GM and TA's comments as concepts in the following table (Fig. 30; App-MBt, figs 4–7).

number of <i>Mack-it notes</i> returned	category	concepts identified from <i>Mack-it notes</i> and <i>Buidling Experiences 1</i> transcript in response to <i>Building Observations</i> log book	frequency	rank
16	elderly visitors	55-65 year olds, most common visitor demographic, most likely to complete feedback forms, difficulties moving through the building, lift, accidents, comfort, new portable gallery stools – current action	18	3
	children as visitors	low numbers, interested children v. disengaged children, school visits, engaging with young visitors, noise and disruption, new activity sheets – current action	16	4
	visitors with specialist knowledge	standardised information, architects, student groups, enriching existing knowledge, guides' dread, questions, new specialist building tours – current action	13	7
	foreign visitors	verbal delivery of tours in English, translation sheets, languages, German, French, Italian, Japanese, Spanish, considering Russian, Chinese, Swedish and Dutch, format, new interactive version, rule breaking, photography, lack of feedback, sharing ideas to develop new visual version	20	2
	tour guides	responsibilities, interpreting, contextualising, develop a knowledge of Mackintosh, reinforce rules, diverse disciplines, community, professional experience, guardians, training, encourage feedback	29	1
	students	v. visitors, protection of students' work, limited interactions with visitors, different experience of Mack, abusers of the building, able to sell work in the shop, making their work commercial, based across campus	17	5
	builders	good relationship, ensuring the safety of visitors	6	8
	GSA departments	GSA Enterprises, minimising tour impact, collaborating with estates, marketing, archives and collections, directorate, gatekeepers, access, conservation, generating income, provide an engaging experience, infrastructure, ensure students' relationship with the Mack	17	6

Fig. 30. Cara Broadley (2012) *Conceptualising GSA Enterprises' experiences of the Mackintosh Building user groups* [table]

As the table confirms, GM and TA talked extensively on the subject of foreign visitors and issues of rule breaking implicated by language barriers. My inclusion of the visitor feedback process and forms in the *foreign visitors* category corresponds with GM and TA's insights on low return rates from non-English speakers and our ideas to create a multilingual visual version to collect their comments (Port-MBt; App-MBt, fig. 4).

This drove my creation of the *Prototype foreign visitor feedback tools* to structure the *Building Experiences 2* interview (Broadley, 2012a; Port-MBe). My objective was to present GM with three prototypes, consider their usefulness, and discuss the possibility of piloting one with visitors. As I indicate in chapter three, GM expressed reservations over my translation of Charles Rennie Mackintosh as a LEGO figure in *Prototype foreign visitor feedback tool 2* (App-MBt, fig. 8). She was also concerned that the tools' questions deviated too far from those in GSA Enterprises' existing form, and that installing a post box in the GSA shop could be disruptive. Such concepts respectively contributed to my formation of categories that qualify the *tone of the tools*, *value of the tools*, and practical problems associated with *piloting* them with visitors.

Despite tentatively agreeing to pilot *Prototype foreign visitor feedback tool 1*, GM was resistant to its visual style and enlisted an additional staff member to urge me to forward my digital artwork and allow their modifications of content and layout (App-MBt, fig. 9). In light of this ill-defined collaborative relationship, I positioned the *roles of our team members* as a further analytic category. The table shown in Fig. 31 conceptualises GM's responses to the prototypes, accounts for her reluctance over the piloting process, and supports my decision to adjust the user focus of the case study.

category	concepts identified from <i>Building Experience 2</i> transcript in response to <i>Prototype foreign visitor feedback tools 1, 2, and 3</i>	frequency	rank
tone of tools	reservations over image of Mackintosh and LEGO Mackintosh, conflict between playfulness and serious tours, assumption that adults will not participate, inappropriate images	17	1
value of tools	different questions from existing form, how to capture data relevant for all our aims, short term v. long term, process v. outcome, financial benefit	6	3
piloting	testing with kids and school groups, disclosure and consent, my facilitation, not upsetting the balance of the tours and shop, decisions date and time, number of visitors	13	2
roles of team members	ownership of tools, creative control, sending digital files, power	7	4

Fig. 31. Cara Broadley (2012) *Conceptualising GSA Enterprises' responses to Prototype foreign visitor feedback tools 1, 2, and 3* [table]

GM and TA's earlier insights surrounding the school's desire to sustain relationships between students and the Mackintosh Building via the campus shuttle bus illuminated their perceptions of the building as GSA's focal point (App-MBt, fig. 3). Nevertheless, the majority of GSA's students were based in other buildings across the campus and the School of Design's temporary base at Skypark, and therefore had reduced direct contact with the building on a daily basis. I sought to investigate how undergraduate and postgraduate design students perceive and use the Mackintosh Building, and how they could conceive products, services, and systems to improve their experiences of studying at GSA (Port-MBe; see Fig. 26).

The *Building Experiences 3* workshop began with an open-ended brainstorming exercise to divergently explore the students' perceptions of the Mackintosh Building (Broadley, 2012c). Recounting their early impressions, the students commented on its historical status, iconic appearance, and their interactions with its swinging entrance doors. Others drew from their awareness of the building as the School of Fine Art and their initial feelings of intimidation and exclusion as design students. When asked to share any difficulties encountered during a typical working day, the students discussed departmental isolation and an assumed absence of community spirit at the school at large. They expanded on problematic aspects of GSA by describing the complexities of working with students and staff from other departments, ineffective signage, and a lack of consistent organisation (App-MBt, figs 10–11).

After forming two groups, the students identified one reason for visiting the Mackintosh Building and sketched explanatory user journey matrices to map its stages and the people, places, and artefacts they encounter. I encouraged them to visualise the physical actions that they carry out, the emotional aspects of this journey, problems experienced, ideas for improvements, and positive aspects to be exploited. Insufficient information and the practical difficulties of moving between campus buildings confirmed that communication and navigation across the school were prevalent issues to be addressed (App-MBt, figs 12–13).

In the next phase, students consolidated these problems and opportunities by writing collaborative break-up letters. While group two reiterated divisions and hierarchies amongst departments in their letter to the Mackintosh Building, group one addressed theirs to Skypark to articulate a perceived lack of inter-school communication and exhibition information (App-MBt, figs 14–15). I provided each group with oversized matriculation card templates and asked them to conceptualise their target GSA users. The students imbued their user profiles with factual information (such as year groups and disciplines) and imaginative qualities (such as their names and personal tastes) to construct fictional characters, drawn from their own experiences (App-MBt, figs 16–17).

These completed tools operated as the students' design briefs. Sketching storyboards and prototypes to represent their collaborative design proposals, both groups emphasised campus distribution as symbolising the physical distancing of students and considered alternatives to the Virtual Learning Environment online information system to enhance cohesion between departments (The Glasgow School of Art, 2013d; App-MBt, figs 18–19). Group one suggested installing a digital interface in Skypark, displaying a live guide to exhibitions, seminars, and social events. Group two conceived a smart phone application featuring updated shuttle bus notifications, an 'ask Mack' bespoke search engine, and a message board to strengthen interdepartmental relationships and interdisciplinary collaborations.

number of sticky notes, user journey matrices, break-up letters, user profiles and prototype sketches returned	category	concepts identified from <i>Building Experiences 3</i> workshop tools	frequency	rank
60	motivations to visit the Mackintosh Building	essay hand-ins, electives, pick up packages, meetings, lectures, registry, finance office, pay accommodation fees, posh toilets, exhibitions	11	7
	limited use of the Mackintosh Building	not really at all, never, twice a year, hardly ever – too far away, long distance relationship, journey is a mission, takes up a huge part of the day	16	4
	lack of shuttle bus use	walk, cycle, poor timetables	17	3
	segregation between disciplines	no integration between design and fine art, no community, would love a studio in the Mack, no sense of belonging or equality, intimidating, hierarchy, lack of social interaction, feel like an intruder, judged, stranger, tribal, divided, office v. museum	20	2
	perceptions of form and function	old, creaky, swinging doors, historical, beautiful, good windows, arm candy, a slap in the face	9	8
	problems of organisation and access	unclear information, poor signage, lack of communication and understanding, mixed signals, bad lifts, problems with doors, lack of exhibition information, lack of support, poor Virtual Learning Environment, different matriculation cards to access	45	1
	opportunities for inter-departmental collaborations	knowledge exchange, studio exchange, sharing skills, year groups over departments, making friends	12	6
	opportunities to enhance communication	access across campus, exploiting the shuttle bus, communicating with tutors through technology, real pigeon holes, centralised space, interactive personalised calendar, smartphone application, touch-screen noticeboard	15	5

Fig. 32. Cara Broadley (2012) *Conceptualising GSA design students' experiences, problems, and ideas* [table]

Comparing the prevalent themes emerging from the workshop, I conceptualised the students' comments, responses, and outputs, and organised them into categories in the table shown in Fig. 32. As is reflected in the *limited use of the Mackintosh Building* category, the students conceded that they rarely visited the building (App-MBt, fig. 20). When asked to explain any *motivations to visit the Mackintosh Building*, they listed necessary tasks including paying accommodation fees, carrying out administrative duties, and submitting written work. Only one student mentioned that they attended exhibitions, while another noted the lure of the building's 'posh toilets' (App-MBt, fig. 21). All students admitted to their *lack of shuttle bus use* due to its inconsistent timetables and chose to walk or cycle between campus buildings (App-MBt, fig. 22). Expressing physical and emotional stress points in their user profiles and break-up letters, the students described the relationship as long distance and claimed that negotiating the campus 'takes up a huge part of the day' and 'feels like a mission' (App-MBt, figs 15 and 17).

The table highlights the segregation of academic departments and creative disciplines as a prominent conversation point in the workshop. My interrogation of the students' relationship with the Mackintosh Building incited discussions of intimidation and fear of intrusion when visiting, disappointment and resentment at being relegated to buildings of inferior cultural value, and perceptions of a lack of community at GSA. The *form and function* category corresponds with the students' early expectations and first impressions of the building, and thus had little bearing on their interpretations of GSA's infrastructure. As such, ineffective communication and promotion of cross-school events and impractical procedures of using multiple matriculation cards to enter buildings were the most prevalent issues. Together with the *segregation between disciplines* category, *organisation and access* accounted for the students' limited interactions with the building and the shuttle bus service.

These insights shaped their proposed *opportunities for interdepartmental collaborations* and *opportunities to enhance communication*, as explored in the final prototyping exercise. The relatively low frequency of ideas to innovate and

change GSA student life stems from my structuring of the workshop to primarily understand the student users' current perceptions, uses, and experiences of the Mackintosh Building, before enlisting their design skills to explore solutions to these first-hand problems. Preliminary ideas generated included the reintroduction of pigeon holes as a non-virtual method of communication, individual digital calendars to be populated with student-specific activities and deadlines, and increasing students' skills and integration across GSA's campus through a 'studio exchange' (App-MBt, figs 24–25). The prototyping session inspired the students' collaborative sketches of smartphone applications and touchscreen noticeboard interfaces to render communication more transparent and to enrich their academic and social interactions with their peers from other departments. Such interventions could provide design students with ample motivations to visit the building.

In mediating the three stages of data collection in this case study, my position alternated between a visitor on the tours, a student at the school, and a researcher and designer investigating the experiences of users and stakeholders to propose ways that these could be enhanced. These roles informed my developing subjective knowledge across the case study and the emotional character of my encounters with contrasting participant groups. Undertaking a reflexive analysis, I proceed by replicating my LEGO scenario technique in the *Mackintosh Building autoethnographic drawings*. These allow me to comparatively visualise and analyse my interactions with GSA Enterprises and the students and to evaluate the interview and workshop tools' impact on the human-centred design process (Port-MBr).



The Mackintosh Building reflexive analysis: critiquing, compromising, communicating, collaborating

A critical event, the first interview established the foreign visitor feedback process and student Mackintosh Building experience as two design opportunities. Simultaneously, the tools for participation uncovered a sense of hostility surrounding GM and TA's resistance to my methodology and their reservations over my motivations and goals. Conveyed by my switching to a subjective camera angle, a gradual reduction of light within the composition, our increasing physical distance, and their suspicious and defensive expressions, drawings 13–16 mark my growing realisation that sustaining rapport, empathy and consensus through our collaboration would be complicated, prohibitive, even destructive (Port-MBr). A middle-man in the interview, *Building Observations* operated as the material manifestation of my voice. Its subjectively satirical imagery provoked GM and TA's objections while the *Mack-it notes* supported their right to reply and my deconstruction of their experiences as tour service coordinators.

Remaining resilient through the case study, drawings 17–21 describe my textual transcription and visual mapping technique to organise the interview content and highlight a suite of opportunities. The creation of a visual feedback tool for foreign visitors was a rare area of consensus between the staff and myself, and thus indicated that a dynamic working relationship could be encouraged by my three prototypes. Examining drawings 26–28, I identified the second interview as a further critical event (Port-MBr). These images remain in the subjective perspective to cement my enduring feelings of disconnection. Mediated by my presentation of each tool, my attempts to undertake an innovative redesign of the visitor experience were thwarted by GM. The prototypes welcomed her

constructive input and modifications; she revelled in their imperfections and did not propose any ideas for improvement. In drawing 28, I show GM considering to pilot the first tool. However, as I allude to in evaluation-in-action and tool response analysis, her inclusion of an additional staff member in our discussion and their desire to independently alter my artwork served to exclude me from the process (Port-MBr).

This develops my insight stemming from the first interview that the overtly subjective nature of the tools symbolised our contrasting perceptions of the Mackintosh building, and our opposing professional aims. By assuming ownership of *Prototype foreign visitor feedback tool 1*, GM reinforced her power as a manager and diminished my position to that of an idealistic student. Her goal was to arrive at a predetermined outcome to benefit the school financially; mine was to explore foreign visitors' experiences, needs, problems, and aspirations in an open-ended and qualitative platform. These conflicts of interest led to my diplomatic exit strategy as a cumulative critical event (Broadley, 2012b). Upon returning to *The Mackintosh Building visual transcript* to search for alternative opportunities in drawing 30, I investigated the relationship between design students and the Mackintosh Building. The camera angle reverts to a wider objective shot, revealing myself as no longer isolated, insular, and alone, but as a designer and researcher with a newfound direction and agency, liberated in the absence of constraints and naysayers (Port-MBr).

Following this revelation, the rapport and empathy harnessed in the *Building Experiences 3* workshop provided an enlightening culmination to the case study. My moustached cupcake illustration on the promotional poster, my offering of lunch as an incentive, my invitation that students use the synthesiser I provided to voice any confusions, their introductions through name badges and informal questioning in the icebreaker session: the students' interactions with the workshop props invoked a lively camaraderie from the offset (Broadley, 2012c). Moreover, the blank canvas nature of the tools, as seen in drawings 35–40, imparted an inclusive dialogue and promoted their articulation of experiences and ideas (Port-

MBr). Expanding on this insight, I contributed not solely by facilitating activities and collecting data, but as a fellow design student at the school and a Mackintosh Building user myself. In drawing 36, I took a step back to photographically document their creation of the user journey matrices. Foregrounding myself in drawings 37 and 38 when some students' inhibitions became apparent, I verbally shared my personal feelings to encourage their expressive identification of problems in the break-up letters and user profiles. These visualisations helped the students transform the blank rolls of paper into prototype sketches and storyboards for presentation and final peer feedback (Port-MBr).

The workshop tools were essential in inducing and maintaining these collaborative bonds. Their arrangement instilled my five-stage methodology's participatory and reflexive foundations across undergraduate and postgraduate design disciplines to compile a network of students with complementary abilities. Addressing the students' discussions of insufficient communication and a lack of community, the tools sustained our relaxed, playful, yet focused and progressive designerly activities. Conversely, my visualisations of problems in *Building Observations* were received by GSA Enterprises as a negative appraisal of their promotion of the school as a visitor attraction. This strained my relationship with GM and TA. By exposing my thoughts and feelings in the logbook's expressive format, I temporarily became a passive listener in my own research process and relinquished my control as a designer.

These critical events and insights demonstrate that while the case study interactions were on occasion fraught with emotion, confrontation, and clashes, each tool established a point of reference to stimulate intense dialogue and prompt opposing and consensual perspectives of the building. As I go on to evaluate, these intersubjective interpretations advance the application of tools and techniques that incorporate the designer's experiences as a user of the sociocultural setting.



Navigating content, format and tone: tools for mediating an intersubjective dialogue?

I conclude this chapter by layering the findings of tool response analysis with my reflexive analytic accounts. A sequential and comparative evaluation of the case studies aids my identification of the dominant sociocultural insights and modes of engagement fostered by the particular aspects and attributes of the tools and techniques within my five-stage participatory-reflexive methodological compass. In doing so, I also begin to assimilate each case study's shortcomings and consider the limitations of my reflexivity and subjectivity in the human-centred design process.

Aspiration with confrontation: redesigning consultation in the community

My tool response analysis of the *Visual questionnaires* indicated the Rothesay residents' contrasting positive and negative perspectives of the THI and a division in consensus over the town's future. This juxtaposition was evoked by my watercolour drawing technique in the *Rothesay autoethnographic drawings* and their visual framing of social, cultural, and environmental tensions. Bridging the orientation and participation stages, graphic simplification of the original *Rothesay experiential drawings* translated the gaps in my knowledge to the *Visual questionnaires* and informed the accompanying questions. Mutual empathy was incited by my verbal introductions to the residents, extended by their annotations, and evaluated by my reflections on this dialogue. Exemplified by tool response analysis, some residents completed the *Visual questionnaires* by imposing

representational or symbolic drawings and explanatory captions over the tools' imagery. Others, however, adhered to a more familiar procedure of writing their (sometimes closed) answers next to my questions, suggesting that rather than being guiding, the *Visual questionnaires* were leading to the point of being prescriptive.

Despite this, evaluation-in-action yielded insightful qualitative data. Drawn conceptualisation and categorisation of the residents' experiences and aspirations inspired the *Haste ye Bute prototype*. Presenting this visualisation initiated further community engagement and resulted in the residents' more focused articulation of the town's problems and my deeper understanding of their needs. The *Visual questionnaires'* accessibility and permanence as material artefacts implies that the pressure of being probed for drawn and written responses contributed to some residents' apprehension, inhibition, and refusals to participate. As an unobtrusive alternative to the survey format, the *Haste ye Bute prototype* operated as a provocative and ideational tool to prompt brief and informal, yet rich conversations. Rapport emerged as a form of elicitation that was not dictated by the visuals, but supported by them.

My position in the case study as a visitor, designer, facilitator, and analyst channelled these interactions alongside feelings of hostility and resistance. These phenomena may be deemed undesirable elements of human-centred design exploration, yet it is precisely this disruption, instigated and understood sequentially through the five-stage participatory-reflexive methodology, that confirmed the residents' dissatisfaction with the THI and illuminated the need for bespoke methods in future community consultation.

Participation with play:
reconsidering remote and direct facilitation

Subjecting the *Islay pre-pack* and *Islay workshop pack* returns to tool response analysis confirmed that the concept of family was embedded in the data collected from the pupils. The presence of participatory tool creation in the *Family as Community* proposal stemmed from my subjective encounters: I recalled the pupils' sayings and doings alongside their drawings and writings, and simultaneously sought to emulate the productivity of my collaborations with the MDes students and my mother's anecdotal storytelling. Distilled retrospectively in reflexive analysis, the *Islay autoethnographic drawings'* stylistic naivety and compositional intertwining of people and material things epitomises the centrality of contextual conversation across the case study. The workshop's prevailing conviviality positions my reported experiences of facilitating participation as being of comparative richness to the data recorded by the probes.

The tool returns provided clues rather than concrete evidence. While duplications suggested areas of consensus, the information the pupils provided was, on the whole, idiosyncratic and exploratory. Their evaluations of the ideas generated in our proposals were not attained due to time and travel constraints, but consensus and critical refutation were central aspects of our student design team's discussions. A shared studio space enhanced group cohesion and developed our collective understandings of preliminary information and local objectives. Accentuated by the *Islay autoethnographic drawings'* playful tone, this convivial and democratic relationship was upheld by our shared desk research visualisations.

Although told from my subjective family perspective and administered remotely by post, *Rural Legends'* visual qualities and position in the *Islay pre-pack* introduced and instilled drawn, written, and verbal storytelling as the workshop's ethos. In comparison, excessive graphic and physical spaces contributed to the *Story map* and the envelope task's open-ended nature and corresponding low return rates.

These findings indicate that when the designer is present to reiterate the process and their purpose, hands-on, creative methods can afford and sustain participants' considered responses. Accompanied by the *Islay workshop pack*, our facilitation aroused an overwhelming atmosphere of camaraderie and rapport. We welcomed and received the pupils' expert knowledge while they encouraged our subjective stories, mediating a more empathic and reciprocal understanding of each other's lives. As an experiential and empathic construct, this intersubjective dialogue underlined familiarity, storytelling, and play as the case study's overarching tenets.

Bespoke with space: repositioning the designer as user

Tool response analysis affirmed *Building Observations*, the *Mack-it notes*, the *Foreign feedback tool prototypes 1, 2, and 3*, and the *Building Experiences 3* workshop tools' capacities to elicit local insights, inform design opportunities, and expose discrepancies. My focus on self-preservation in light of stakeholder conflict is highlighted by the *Mackintosh Building autoethnographic drawings' mise-en-scène*: a subjective camera angle, dim lighting, dull colour, and the opposing positions of actors and props. Both modes of analysis elucidate GM's, TA's, and my own implicit and direct interpretations of the design student user experience and the tools' harnessing of varying degrees of consensus.

My tacit knowledge of the Mackintosh Building's museum/art school duality and brief phase of desk research underpinned my examination of the public tours and visitor experience through participant observation and subsequent experiential drawing. Divergent sketching, note-taking, and expressive visual conceptualisation allowed me to empathise with visitors and problematise my subjective insights. Challenging the latter case study tools' questionnaire and probe formats, *Building Observations'* uncensored experiential commentary and the *Mack-it notes'* focused questions and open spaces promoted the tour coordinators' reflections. This advanced the five-stage participatory-reflexive methodology's ability to balance my experiences as a designer with those of the stakeholder staff. Yet, while TA

compared her written responses to the content of my drawings, GM returned the annotated notes to their packet, failing to connect her insights to the images. Reiterating the difficulties of negotiating understanding through participatory methods remotely, these observations suggest that the interview design was overly ambiguous or too complex.

Echoing the Rothesay and Islay tools' limitations, the returned *Mack-it notes* alone were one-dimensional and insufficient. Yet when used in conjunction with the logbook in the interview, they helped contextualise and co-evaluate our experiences and interpretations of the Mackintosh Building's many user groups. We reached a temporal understanding and consensus to collaboratively design and test a feedback tool for foreign visitors. Corroborated by tool response analysis and reflexive analysis however, our struggle to agree on the device's content, format, and tone unfolded in the second interview and prompted my refocus on the design student experience.

As graphic playfulness was advocated by the Islay study, I imbued the break-up letters and user profile templates with familiar iconographic devices (a sheet of ruled paper; a GSA student matriculation card). Even when asked to sketch their user journey matrices, storyboards, and prototypes on blank rolls of paper, the students required little instruction. I attribute their participation and the workshop's conviviality to the tools' combination of pre-designed templates and empty white space. Subsuming play and contention, these material co-designers mediated our interpretations of the building. Their bespoke imagery and annotatable spaces invited participants to express their experiences, locate problems, and propose solutions. The workshop tools scaffolded and sustained dialogue and collaboration, but the logbook and notes perhaps lacked space and were ultimately overtly subjective. Perpetuated by their lighthearted graphic tone, the artefacts I designed and used with GSA Enterprises illuminated the tensions associated with our distinct roles and perspectives. In effect, the drawings' rhetoric reinforced an intersubjective dialogue as my personal biases were externalised, and subsequently challenged.

Subjective, intersubjective, and reflexive participation by design

In line with the central research aim and the research question, tool response analysis was a useful strategy for organising, aggregating, and categorising the local information I collected with each participatory tool. At the same time, the modes of engagement fostered by these artefacts were identified through my reflexive analysis of the case study interactions, as displayed in the autoethnographic drawings' narratives. The content, format, and tone of the case studies informed and inspired their direction and my decision making. The interplay of visual and verbal dialogue via my cooperative facilitation of the tools was essential in affirming this insight.

I drew from my experiences to construct questions and inject the tools with a lively artistic style. As visual hypotheses, the inquisitive tools waited patiently to be adjusted and amended through exploratory phases and activities. They gathered rich, interpretative clues to underpin the human-centred design processes and the interventions I proposed, but they also incited a shared understanding of designerly approaches and local issues. They visually expressed subjective feelings and transferred empathy, breaking down hierarchical barriers to stimulate rapport, camaraderie, conviviality, and play. They provided a basis for situated discussions of shared problems and consensual aspirations. They uncovered participants' reluctance and resistance, and feelings of tension and hostility as forms of (dis)engagement, signifying a need for modification and iteration. Throughout the studies, the tools' idiosyncratic visual qualities attracted participants' attention, sparked their interest, excited and inspired, angered and provoked. They were written on, drawn on, pointed at, picked up, talked about, criticised, celebrated, and ultimately, witness to an emotionally complex and intersubjective dialogue. My analytic accounts in this chapter have progressed both research questions' investigation of visual and participatory tools and techniques to stimulate sociocultural information and aspirations from participants whilst establishing, managing, and sustaining productive human-centred design relationships. This acknowledges the synthesis and interpretation of my subjective insights in tandem with the participants' experiences.

My visual practice is an enduring methodological presence. It is transparent in my externalisation of desk research, my observational photographs, sketched fieldnotes, and the experiential drawings comprising the orientation stage. It is embedded in my graphic considerations when designing the tools for participation. It is central to my drawn organisation of participants' generated concepts, and in my creation of physical and experience prototypes in evaluation-in-action. Comparatively, it is evident in my written qualitative reflections on the annotated tools, and formalised quantitatively as a visual display of data in tool response analysis. Imbuing the autoethnographic drawings with my experiential feelings bestows them with dual function. They are at once illustrative research outputs to describe my immersion in the case study settings, and analytical tools to visually unpack my subjective encounters as the central designer and researcher: the decisions I made, the catalysts and hurdles I negotiated, the key insights I construed, and the sociomaterial interactions I experienced.

This suggests a means by which human-centred designers can retain and develop their identities as visual makers. Acts of mark making to understand, participate, and evaluate are supplemented by verbal and textual interpretation, and extend the designer's position as a visual analyst. The subjective foundations of my own five-stage participatory-reflexive methodological compass position the tools and techniques as expressions of my particular identity as a visitor, student, designer, researcher, and participant. The methods embodied my tacit experiences and knowledge developed through my practice, and thus, their replicability and transferability to other designers could be called into question. In the following chapter, I consolidate my analytic findings to evaluate the five-stage participatory-reflexive methodology as a holistic, inclusive, and adaptable framework for balancing information and relationships, and designers and participants in human-centred design exploration.

FIVE

Exporting a participatory-reflexive methodology: repositioning human-centred tools, techniques, and designers

In this chapter I interrogate the visual and participatory tools and techniques that accompanied my data collection and analysis in the case studies and the impact these have on my position as the central designer and researcher. Situating my original contribution to knowledge in the field of human-centred design, I draw from debates surrounding processes, methods, and roles to advocate the adaptation of the participatory-reflexive methodology's five stages by other practitioner-researchers in diverse case study settings (Fig. 33).

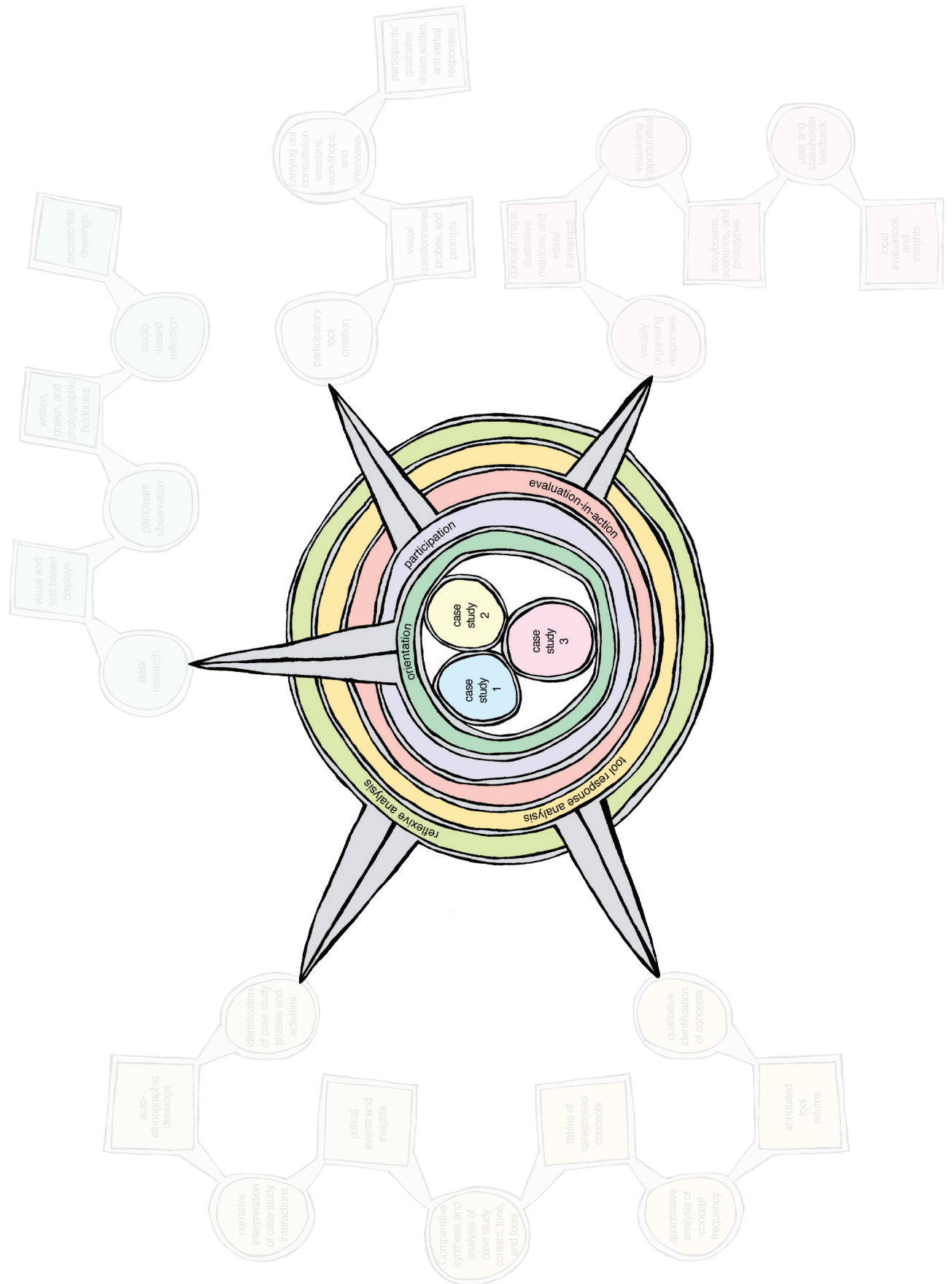


Fig. 33. Cara Broadley (2013) *Calibrating my five-stage participatory-reflexive methodological compass: evaluating tools, techniques, processes, relationships, and roles to communicate the original contribution to knowledge* [diagram]

Following the modes of engagement discussed in chapter four and in respect of the research question, I evaluate my own five-stage participatory-reflexive methodological compass to position images and artefacts as integral components of human-centred design exploration. I deconstruct the orientation and participation stages and consider how the tools' and techniques' aesthetic qualities supported my subjective understandings of sociocultural settings, participant engagement, data collection, and collaborative social relations. I discuss how visual mapping techniques supported my intuitive evaluation-in-action of the participants' responses, while the storyboards, scenarios, and prototypes instigated dialogue to reveal further insights. I reflect on my scrutiny of participants' concepts during tool response analysis and critique the autoethnographic drawings I produced during reflexive analysis as methods to disseminate the interrelated practices and arrangements of people and things.

I then assess the synthesis and analysis of data for both informational and inspirational purposes and present six recommendations for designers when making, using, and interpreting human-centred design tools and techniques. Critiquing established methodological toolkits, I put forward the five-stage participatory-reflexive methodology as an alternative bespoke and creative approach that is capable of mobilising experiential insights and building relationships with users and stakeholders.

The data that emerged in each case study encompassed the voices, expressions, and actions of the participants and designers. I thus develop constructivist premises to ascertain that the tools and techniques generated and embodied intersubjective knowledge. Adhering to the secondary research aim to assess the designerly implications of this methodological practice, I conclude the chapter by locating my multifaceted persona as an ethnographic explorer and storyteller, a visual maker, a strategic and empathic facilitator, and an intuitive interpreter. Reinforcing the human-centred designer's expertise and agency, I propose that an enhanced level of reflexivity enriches their awareness of complex issues and their identification with others.

Advancing the five-stage participatory-reflexive methodology

I attribute the empathy, rapport, consensus, and dialogue I experienced with participants firstly to the understandings I gained during orientation. With connections to Mattelmäki's tuning-in phase and the scoping and discovery stages of the design process models, orientation allowed me to explore each case study setting, determine problematic issues, and consider suitable users and stakeholders to engage with (Koen et al., 2002: 8; Mattelmäki, 2006: 96; The Design Council, 2005; 2007b: 8; Hanington and Martin, 2012: 7). The data collection and evaluation that occurred during the first three stages of the methodology can be thus be viewed as a scaled-down Double Diamond model (The Design Council, 2005; 2007b). However, the divergent and convergent phases of the case studies were formed and shaped from the offset by my experiences and practice. As such, the exploratory phase central to the five-stage participatory-reflexive methodology is closer in character to the complex and chaotic web of activities that occur in the fuzzy front end of the human-centred design process, prior to the active integration of user and stakeholder participants as co-designers (Sanders and Stappers, 2008: 6–7). This notion of a process that cannot be standardised, but is pliable enough to be modified in action conforms with Lincoln and Guba's conjecture that new concepts are achieved through sharing constructions and collective sense-making (2013: 47). Progressing my identification in chapter one of insight gathering, idea generating, and decision making as key objectives to advance human-centred design exploration, my tacit knowledge operated as a basis for seeking input from others.

Upon embarking on the Rothesay case study, I located secondary texts to investigate sociocultural, economic, and environmental issues, travelled to the town to observe these first hand, recorded my visit photographically, and reflected on these sets of data through making the *Rothesay experiential drawings*. Observation is posited as a means to perceive user behaviour (Fulton Suri, 2005: 166; Burns et al., 2006: 18; Kelley, 2008: 19–20; Brown, 2009: 40–55; Moore, 2010: 7; Norman and Verganti, 2012: 15; Hanington and Martin, 2012: 120–121,

124–125; The Design Council, 2013; Helen Hamlyn Centre for Design, 2013; HCD Connect, 2013). Yet, recalling my misgivings of note-taking in Burns' design masterclass (2011), in a discipline accustomed to communicating functionality and symbolic meanings visually, there appears to be a division of emphasis placed on photographs, diagrams, and drawings as designerly documentation. Fulton Suri deems photographs impressionistic repositories of insight for designers, and while cameras and video equipment are inferred as recording devices, little conceptual reasoning is provided to qualify the value of visual thinking (Fulton Suri, 2005: 162; Brown, 2009: 80–83; The Design Council, 2013; Helen Hamlyn Centre for Design, 2013).

My immersion in the field and visualisation of personal insights enabled an inner dialogue and prompted my creation of the experiential drawings as ideational visions. I confronted my conflicting presuppositions of nostalgia and decay in Rothesay, reduced the distance between myself and the Islay pupils by building a cultural affinity, contested my assumptions of the Mackintosh Building tours, and explored my fellow GSA students' experiences. Rather than existing solely as observational renderings of encountered events, the experiential drawings are tacit, emotive projections of the people, places, and problems I witnessed. The visual techniques I employed forged lasting material bonds with each environment. Inspiring the tools I made and used in the participation stages, orientation bridged discovery and definition in my methodology. A human-centred design process that is continuously tailored by internal and external constraints and drivers transmits bespoke tools and techniques that correspond to the designer's inquiry and their selection of participants (Clarkson and Eckert, 2005).

In participatory tool creation, I transformed the experiential drawings into material artefacts. Three-dimensional in their physicality and function, I posed textual questions on the tools' surfaces and strengthened graphic elements to reiterate myself as their creator. Discussing trajectories for innovation, Norman and Verganti assert that human-centred design practice and research must reconsider technological change and meaning change as two forces external to the process.

They urge designers to break from established creative stages and methods in order to more closely interrogate and interpret the experiences and needs of users and stakeholders (2012: 5–6, 17). I believe that participatory design has already risen to this challenge. Subverting the view that knowledge can be discovered through the researcher's careful tracking and describing of objective relations (Latour, 2005: 144), Ehn poses a mediation of material and social agency, in which technological developments and direct human communication are entwined in an iterative cycle of innovation:

Design of computer artifacts is an activity of determining these artifacts so that they can be constructed and implemented. Hence, the technical interest in instrumental control. But it is also a dialogue and a participatory relation between those concerned about the computer artifact being designed. Hence the practical interest in inter-subjective communication. Considering the use situation designed for, there is the same doubleness. Computer artifacts may be designed to support control of objects as well as to facilitate dialogues and inter-subjective communication.

Ehn, 1989: 27

I align human-centred design relationships with Ehn's considerations of human and non-human exchanges in participatory design practices. However, Bedell's misgivings over the human-centred designer's agency entail the precarious position of my artistic style in the participatory landscape (2005). Writing on the status of aesthetics in design thinking philosophies, design researcher Cameron Tonkinwise imparts a deep sociological entrenchment of design practice (2010). Appropriating Bourdieu's habitus, he disputes the suppression of designerly authorship and calls upon the cinema director's practice of arousing plot, character, and emotion through visual styling (Bourdieu, 1989: 131). Tonkinwise maintains, by correlating characterisation in cinema with that of user persona tools, that designers are likewise 'Bourdieuian sociologists' who communicate through imagery and possess an innate ability to discern the values and judgements of others (Tonkinwise, 2010: 384, 386). In spite of the viewer's capacity to interpret the director's vision in relation to their own habitus, the designer actively positions

personas as objects for discussion and iteration, prior to embarking on these conversations with the participants in person. Yet while Bourdieu states that research participants are unable to recognise and articulate the reasons behind their practical mastery of everyday activities and that this is the job of the expert researcher, Anthony Giddens contends that reflexivity is intrinsically social and essential as humans necessarily 'take so many forward-oriented decisions' (Bourdieu, 1977: 19; Giddens 1998: 90). My methodology's reflexive ethos integrated users and stakeholders into stages of participation, anchored by our communication via methodological images and artefacts.

Our team of student designers created the *Islay pre-pack* and *Islay workshop pack* to stimulate a verbal and visual discourse with the pupils regarding current island life and as material to inspire innovative design opportunities. In this sense, familiar aesthetic artefacts firstly ground activities in participants' routine practices of daily life, before transcending these tangible experiences to envisage future scenarios (Steen, 2011: 52). The workshop was punctuated by the probe packs while a rich dialogue unfolded. Stressing the participant's agency in human-centred design, Kimbell reconfigures design thinking in respect of the knowledge produced during collaborative interdisciplinary processes (2009). Her alternative terms 'design-as-practice' and 'designs-in-practice' respond to the discipline's prevailing social and material presence as both subject and object, process and outcome (2009: 11). To discover practice-based knowledge, Schatzki advocates a cross-disciplinary transference of ethnographic participant observation and methods including focus groups, meetings, video documentation, interviews, and oral histories (2012: 11). Some researchers may be opposed to 'hanging out with, joining in with, talking to and watching, and getting together the people concerned' and will attempt to utilise scientific techniques to study social phenomena, but as Schatzki concedes, there is no substitute for communal participation in the field (2012: 11).

These ideas transpose Goffman's 'we-rationale' as the collective focus in social engagements to designers and participants' cooperation in creative tasks (1963:

98). Verbal explanation, description, and ideation dominated my interactions with the participants, yet the knowledge we collaboratively generated was grounded in the concepts evoked by drawing and writing in, on, and through the participatory tools.

The participants' responses drove the interpretations and decisions I made in evaluation-in-action. Subverting the toolkits' compilation of analytic devices for categorising data, *Prototype foreign visitor feedback tools 1, 2, and 3* arose from my drawn transcription of the first interview in the Mackintosh Building case study (Tassi, 2009; Hanington and Martin, 2012: 40–41, 196–199, 202–203; HCD Connect, 2013). Such sequences of events negotiate a process that is driven by designers and participants' interactive dialogue and the subtextual utterances of the tools and techniques. Developing notions of sociomateriality, Orlikowski's perceptions of organisational practices posit humans' encounters with material artefacts as constituting the knowledge they acquire and embody:

I want to claim that not only is human action dependent on such material matters, but that it is constituted by them. Without the material stuff of our everyday lives, human action would not be possible. That is, practice necessarily entails materiality. And just as materiality is integral to practice, so is it integral to the knowing enacted in practice. Put more simply, knowing is material.

Orlikowski, 2005: 2–3

Reaffirming images and artefacts as mediatory entities within human-centred design relationships, the cooperation of humans and non-humans accounts for the study of design as a 'socio-technical controversy' (Latour, 2005: 80). Networks are cultivated when meanings are born, developed, and transformed into actionable design solutions. As Latour reinforces, recontextualisation occurs when actants converse with their counterparts as innovative entities, rather than mere vehicles of meaning (2005: 128). Corresponding with my reflexive experiences, when I presented the *Prototype foreign visitor feedback tools* to GM, the requirements of the human-centred design process were adjusted from creating a multilingual

device to engage with a broader range of visitors, to generating revenue for GSA Enterprises, to examining the building from a design student's perspective. The artefacts' graphic tones provoked GM's objections to user engagement through play, forced us to deviate from the tool as our initial objective, and brought to light our contrasting motivations and goals.

Björgvinsson et al. accentuate the impact of materiality on creative collaboration and participation, stating that the separation of artefacts as functional products from 'sociomaterial Things as assemblies' is of fundamental concern to design practitioners and researchers (2012: 105). As central presenters that actively facilitate dialogic exchanges between human entities, tools are deemed transformative inducers, carriers, and communicators of knowledge (Björgvinsson et al., 2012: 106). Indeed, as Ehn maintains, practice comprises action and reflection, is undertaken and understood socially, and is therefore a representation of reality in itself (1993: 63). Björgvinsson et al. seek to uncover the role of material tools and techniques, the 'non-human "participants"', and concede that 'this evolving object of design is potentially binding different stakeholders together' through its accumulations of human interaction and dialogue (2012: 106). These views are derived from Ehn's discussions of methodological artefacts as 'active participants in the design thing as a collective of humans and non-humans' (2008: 95). A sociomaterial perspective advances how creative and communal practice is embedded in the five-stage participatory-reflexive methodology, in which the agencies of humans and non-humans are made tangible and accessible through the designer's visually descriptive accounts.

Advancing sociomaterial knowledge creation and the efficacy of epistemic objects, my tools were able to ask questions, to be incomplete, unstable, adaptable, and to elicit participants' responses (Ewenstein and Whyte, 2009). Originally created as the manifestation of my personal knowledge and emerging tacitly through my orientation in the case study settings, the tools' transformation across methodological stages was brought about by an epistemological shift. They exhibited my limited knowledge to the participants and in conversing, collected their parallel experiences as Islay, Rothesay, and Mackintosh Building users.

They displayed how insights evolved, and how sociocultural representations were constructed and reconstructed (Lincoln and Guba, 2013: 49). Operating as *epistemic probes*, they became dynamic, commemorative embodiments of the participation stages, and continually retold their experiences as I progressed through evaluation-in-action to tool response analysis and reflexive analysis (Broadley, 2012d).

As I highlight in Fig. 33, my final analytic procedures were notably distinct from the three stages of data collection and initial evaluation. My philosophical affiliation with constructivism and emphasis on intersubjective dialogue conforms with an ontological break between the staging of phases and activities to collect users' experiences as data, and the value of the human-centred design process itself as an innovative entanglement of multiple subjective skills and knowledges (Bjögvinsson et al., 2012: 103). Rejecting linear and rigid conceptions of design practice, Bjögvinsson et al. endorse a characteristically 'Thing approach', where interactions between designers, participants, tools, and techniques are mutable, mobile, and responsive to the unique demands of each sociocultural setting (2012: 104). In tool response analysis, I scrutinised the participants' drawn, written, and verbal comments qualitatively and quantitatively to identify prevalent thematic patterns of data. In this sense, tool response analysis apprehends Goffman's definitions of linguistic messages that are communicated and received through verbal or written means as being voluntary, intended, storable, retrievable, and ordinarily evidencing a degree of consensus. Conversely, reflexive analysis pertains to expressive messages as information translated to the researcher from the participant 'through the incidental symptomatic significance of events associated with him. In this case one might say that he emits, exudes, or gives off information to someone who gleans it' (Goffman, 1963: 13).

Holistically interpreting the drawings, writings, speech, and interactions emerging from each case study, I assert these modes of analysis as being embodied in, and by, the human-centred designer's practice. Reflexive analysis helped me reframe and communicate sociomaterial interactions as contributory data. I realise that

such analytic procedures may be criticised as declining a rational scientific vision of human-centred design research in favour of emotionalism, anecdotalism, and introspective navel gazing (Archer, 1963; Alexander, 1964; Simon, 1969; Margolin, 1998; Latour, 2005; Cross, 2006). However, to concur with Davies' advocacy of reflexivity in ethnographic research, I profess that traditional observation and interview methods are unable to report an authentic and rounded vision of the research process (2008: 236). Davies' notion of the reflexive ethnographer procures a metanarrative of sociocultural engagement in which the researcher is sensitised to participants' responses, behaviours, and actions (2008: 260).

As I experienced, critical events unfolded, relationships were formed, dialogue was instigated, and decisions were prompted by the tools, but not always recorded directly by them. Correlating placemaking and visual ethnography, Pink positions the researcher's camera as a tool to unlock the multisensory qualities of fieldwork, and elucidates the delicate balance between the content of the research materials and the habitus in which they were produced (2009b: 101, 120–121). My autoethnographic drawings recognise the researcher's subjectivity as a means to disseminate design knowledge. Demarcating data as seemingly accurate facts and data that derives cultural insight from the research experience, Ellis advises researchers to descriptively narrate their encounters in the field by writing autoethnographic stories:

You'd want to tell a story that readers could enter and feel part of.
You'd write in a way to evoke readers to feel and think about your life
and their lives in relation to yours. You'd want them to experience your
experience as if it were happening to them.

Ellis, 2004: 116

The researcher's idiosyncratic vernacular builds empathic connections with participants, collaborators, and audiences and promotes comparisons between personal interpretation and cultural phenomena. Invoking a sympathetic watercolour technique in the *Rothersay autoethnographic drawings*, their layers of

marker pen washes and black ink lines convey my experiences of nostalgic charm and cultural pride on one hand, and harsh decay and apathy on the other. The cartoon aesthetic embodied by the *Islay autoethnographic drawings* mirrors the lively and informal interactions that permeated this case study. In the *Mackintosh Building autoethnographic drawings*, my placement of customised LEGO figures and miniature props against drawn sets of the GSA environment allowed me to vary perspective, lighting, and the staging of action to connote the contrasting relationships I formed with visitors, staff, and students and my fluctuating perceptions of the participatory atmosphere.

I tailored the tools and techniques contained within my five-stage participatory-reflexive methodological compass in response to my immersion in the three case studies. Contextualised against the environmental, community, and organisational settings of Rothesay, Islay, and the Mackintosh Building, the concept of placemaking offered a sociocultural lens through which to examine human-centred design exploration and participation in light of visual and reflexive designerly practice. Recalling my discussions of human-centred design practice and research in chapter one, I propose that the participatory-reflexive methodology's five stages are flexible enough to be iterated and applied in various diverse contexts. In investigating health and wellbeing, education, and commercial and organisational settings, for example, the human-centred designer seeks to gain a broad overview of surrounding issues and to engage with user and stakeholder participants to deeper understand their experiences and needs, before together devising and testing alternative services, products, and systems. The five-stage participatory-reflexive methodology's foregrounding of the human-centred designer via their creative visual practices supports their orientation in unfamiliar cultures, how they manage their roles within these activities, construct intersubjective insights, and form meaningful relationships with participants.

The process is shaped and formed in its initial exploratory phase, and as such, the five-stage participatory-reflexive methodology offers a framework for collecting information surrounding the unmet needs and aspirations of user and stakeholder

participants and initiating productive social relationships. This outcome is most evident in my analyses of the *Building Experiences 3* workshop. By engaging with the GSA design students through visual tools and techniques and in a relaxed and informal setting, I gained a deeper understanding of their perceptions and experiences of the Mackintosh Building. Culminating in our jointly conceived storyboards and scenarios to enhance the student experience of the school, the workshop setting empowered the students to voice their concerns as users and propose ways that organisation, access, and communication can be improved.

It is through this data collection that initial insights are gathered, preliminary ideas are generated, and key decisions are made. Recalling my discussions in chapter one of concept development in the wider process of human-centred design and as Sanders and Stappers recognise, divergent and convergent exploration in the process' early stages provides focus and direction (Koen et al., 2002; Clarkson and Eckert, 2005; The Design Council, 2005; 2007a; Burns et al., 2006; Sander and Stappers, 2008; Eckert et al., 2010; Chick and Micklethwaite, 2011). This sets the scene for user participation and is essential in order for designers to form bonds with users and empower them as co-designers with an active role in shaping preferable futures:

The goal of the explorations in the front end is to determine what is to be designed and sometimes what should not be designed and manufactured. The fuzzy front end is followed by the traditional design process where the resulting ideas for product, service, interface, etc., are developed first into concepts, and then into prototypes that are refined on the basis of the feedback of future users.

Sanders and Stappers, 2008: 7

The human-centred design process is not simply informational, progressing pragmatically towards a consensual solution, but experiential, emotional, tempestuous, and inspirational. As Lincoln and Guba attest, sense-making does not arise spontaneously or passively as a by-product of social interaction, but

is actively construed by participants and researchers through the 'critical act of perception and construction' (2013: 45). Alluding to Bourdieu's habitus as a 'system of models for the production of practices and a system of models for the perception and appreciation of practices', my methodological practice operated as a means of establishing and perceiving shared realities, thus affording a "sense of one's place" and also a "sense of the other's place" (1977: 131). Foregrounding the five-stage participatory-reflexive methodology as a framework for practice and as an object of analysis, the tools I made, used, and interpreted constructed an intersubjective dialogue from the participants' responses and my reflexive reactions as the central designer and researcher.

Six recommendations for making, using, and interpreting human-centred design tools and techniques

Studio-based visualisation, participatory tool creation and use, and the interpretation of returned data were central to my practice-led human-centred design explorations. I propose that the participatory-reflexive ethos of the methodology's five stages will support human-centred designers to respond intuitively and expressively to sociocultural design settings through their own particular practices. I posit the following six recommendations for undertaking these phases and activities.

1. Aesthetic tools; open tools

The toolkits provide innovative methods to stimulate participants' creative responses and project their latent needs and desires (Hanington, 2003: 15). Personas and scenarios, for instance, are deemed best suited to the process' generative stages to envisage future design users, offer foresight, and gather feedback on their contextual interactions. Representations range from hand-drawn characters to stock photographs and textual descriptors (IDEO, 2002; Tassi, 2009;

Hanington and Martin, 2012: 132–133, 150–153; Helen Hamlyn Centre for Design, 2013; The Design Council, 2013). Designer Kim Goodwin advises designers to 'add life to the personas, but remember they're design tools first', whereas Macdonald et al. acknowledge accusations of researcher bias and stereotyping within scenario and persona production (Goodwin, 2008; Macdonald et al., 2010: 3–4).

I appropriated expressive collage, cartoon drawings, and customised LEGO figures to flesh out my observations of the Mackintosh Building users as scenarios and collectively consider strategies to improve the tour service and visitor experience with GM and TA. Designing the user profile templates and profile cards for the GSA design student workshop and participatory session with the Islay pupils, I avoided multilayered imagery and embraced graphic sparsity. When annotating these open tools, the students utilised their design skills and knowledge of the school to assert unmet needs and humanise their target building users. Through its closed questions and playful position in the *Islay workshop pack*, the profile cards recorded pupils' demographic details. Once reunited with the remaining pack returns, these artefacts functioned as personas to inform the prototype systems and services proposed by our design team.

Recommendations that designers reduce or conceal their aesthetic sensibilities to encourage participants' input conflicts with the application of images to aid transparency when communicating complex issues (Hanington, 2003: 15; Burns et al., 2006: 18; Mattelmäki, 2006: 50; Brown, 2009: 80–81). My tailoring of the tools reinforced their role as facilitators in the sociocultural design setting and promoted the participants' confirmations, refutations, and elaborations. With their expert insider knowledge, they recognised my investment in their world (Mattelmäki, 2006: 61–62). This blend of artistic style and personal expression can activate a richer participatory dialogue.

2. Tools to promote a verbal, visual, and written dialogue

Whilst advocating images and artefacts to elicit participants' responses, the toolkits fail to account for the wealth of data that emerges in participatory sessions and how the designer will capture this in a productive, accessible, and compelling way (Hanington, 2003: 15; Burns et al., 2006: 18; Mattelmäki, 2006: 50; Brown, 2009: 80–81). The *Visual questionnaires*, *Islay pre-pack*, *Islay workshop pack*, *Building Observations* logbook, *Mack-it notes*, and *Building Experiences 3* workshop tools invited and recorded participants' drawn and written comments. This material data was consistently underpinned by our discussions of local sociocultural issues. In actively seeking a verbal narrative, I designed the *Haste ye Bute prototype* and *Prototype foreign visitor feedback tools* to augment our conversations and construe participants' insights on the interventions' desirability.

Recalling Lucero et al.'s discussions of instigating dialogue through flexible participatory devices (2012: 19–20), I propose that participants are more willing to interact with creative methods when designers grant them time and space to contextualise images and artefacts through language. Reinforcing verbal interpretation, personal artefact inventories and photographic self-ethnographies are posed as ways to co-evaluate participants' intended meanings (Tassi, 2009; Hanington and Martin, 2012: 130–131, 134–135). In line with these methods, more detailed insights into participants' probe returns were achieved in Mattelmäki and Battarbee's investigation of wellbeing and exercise by conducting reflective interviews (Mattelmäki and Battarbee, 2002: 268; Mattelmäki, 2006: 97). A formal analysis of probe returns is, however, disputed by Gaver et al. on the grounds that the tools' intentions are purely to collect inspirational material:

When we finally receive the results it is clear that they are incomplete, unclear, and biased. We do not ask volunteers to explain their responses. Instead, we value the mysterious and elusive qualities of the uncommented returns themselves. Far from revealing an “objective” view on the situation, the Probes dramatize the difficulties of communicating with strangers.

Gaver et al., 2004: 55

My approach adheres to this spontaneous discovery of clues. As such, Mattelmäki and Battarbee's retrospective consideration of probe returns neglects the participants' reception and perception of the tools and techniques in action. The difficulties they encountered, the areas they lingered on, and the aspects they glossed over may remain unrealised or fade with the passing of time, negating the designer's evaluation and iteration of the method itself. Preferring a written question-and-answer tactic, several elderly Rothesay residents showed signs of inhibition towards the *Visual questionnaires* due to a perceived drawing inability. In comparison, the drawing technique empowered the Islay pupils' self-expression and as the workshop progressed, they grew in confidence and spoke openly in the presence of their images. Undertaking human-centred design as a sensorial activity allows designers to manage and distil abundant data. The designer's understandings of participants' experiences, needs, problems, and aspirations are enhanced by tools that are receptive to the interplay of different modes of communication.

3. Tools for mutual storytelling

Ethnographic engagement and narrative inquiry are promoted by the toolkits as storytelling methods to provoke participants' descriptive responses and stimulate idea generation (Hanington and Martin, 2012: 68–69; HCD Connect, 2013). In the previous chapter, I explained how the omnipresence of visual and participatory tools and techniques initiated exchanges of individual and collective experiences between designers and participants. I therefore view stories as accessible, multidirectional devices that form the basis of dialogue throughout the human-centred design process.

Consolidating the THI literature and my experience of visiting Rothesay, the *Visual questionnaires'* drawings and questions highlighted areas of the town in need of environmental change. The residents responded by filling in the blanks with literal and conceptual aspirations. In *Rural Legends*, I presented my anecdotal

knowledge of Islay to the pupils as a storyboard postcard to incite and later collect their reciprocal narratives. Similarly, I entered into a focused conversation with GM and TA that was suggested by my *Mackintosh Building experiential drawings* in the *Building Observations* logbook, structured by the tour coordinators' written *Mack-it note* responses, punctuated by considerations of problems and opportunities, and rooted in our verbal sharing of subjective stories.

As participatory prompts, the content, format, and tone of my graphic depictions invoked discourses of environmental decay, economic decline, cultural identity, community cohesion, and organisational imbalances and improvements. The tools imparted layers of communicative text, drawings, and speech and brought to light opinions and tensions that may have lain dormant in conventional interviews. Integrating images and artefacts into the human-centred design process signifies a culture of storytelling in which participants can confirm, supplement, challenge, and refute the designer's visual hypotheses.

4. Co-designed and co-facilitated tools

The toolkits' textual recommendations implicate designers' conventional practices of working in teams (Aldersey-Williams et al., 1999; Hanington and Martin, 2012; The Design Council, 2013). Building on my discussions of co-design in chapter one to cement the efficacy of images and artefacts in human-centred design (Steen, 2011: 52), I proffer that inter-team tool creation advances consensus and propels the participatory stages.

Despite collecting many drawn and written responses with the *Visual questionnaires*, my engagement with the Rothesay residents was disrupted by our student team's lack of unity. Yet in the Islay study, the second team's commitment to creating complementary tools set a precedent for the quality of the relationships that we formed with the pupils. Our solidarity was signified by the consistent tone of the *Islay pre-pack* and *Islay workshop pack*, and manifest in our joint facilitation

of the workshop. Bearing the identity of a cohesive design team, our workshop intervention was welcomed by the pupils and their teachers. A multivoiced group dynamic encouraged the pupils' visual and verbal interactions with both the tools and ourselves. When interpreting their responses back in the studio, the packs' collaborative origins supported our shared ownership of all the returned tools, regardless of their individual creator.

Collaboration strengthened rapport and consensus within the design team. Exploratory discussions, visual mapping exercises, and an equitable process of tool creation transmitted these modes of engagement to the participatory workshop via the packs as a form of materially induced karma. My reflexive analysis demonstrates that relationships can be fostered between designers when they make images and artefacts to externalise ideas and communicate propositions. Visually sharing objectives in these early stages enables designers to pool resources, prevent replications, and make tools to introduce themselves as a unified body with a clear goal.

5. Tools and designers in cooperation

Postcards, maps, disposable cameras, and diaries remain typical components of design probes, yet my evaluation of the toolkits confirms the inclusion of these devices in other activities and methods (Sanders and Dandavate, 1999; Gaver et al., 2004: 55; Mattelmäki, 2006: 52; Hanington and Martin, 2012: 55–56). Self-documentation is explicated as a generic technique to learn about participants' lives by viewing their photographs, drawings, and written notes (IDEO, 2002; Hanington and Martin, 2012: 66–67, 134–135; HCD Connect, 2013). Packaged as a whole, the probe concept is grounded in the development of participatory design and the methodological toolkits, but rather than being employed in communal workshop settings, probes are ordinarily administered to participants from a distance to gather details surrounding their daily routines (Mattelmäki, 2006: 85). Following the probes' established premise, I positioned *Rural Legends* and the

Mack-it notes as exploratory and speculative tools to test the participatory waters, while the *Visual questionnaires*, *Building Experiences 1* interview, and *Islay workshop packs* operated as direct methods of engagement.

I introduced myself to the participants through the diagrammatic *Visual questionnaire instruction flyer*, my handwritten greeting on the reverse of *Rural Legends*, the luggage tag attached to the *Islay pre-packs*, and the guidelines included on the *Mack-it notes*' packet. Nevertheless, with the majority of Islay pupils failing to complete the *Story map* and envelope task, such visual and written signposting was limited. The tools were unable to adjudicate participation and were rendered temporarily passive. Once verbally framed as our material sidekicks however, the *Islay workshop packs* leapt into action to extract and document the pupils' perceptions and experiences. Furthermore, upon contemplating their completed *Mack-it notes* and challenging the origins of my visual interpretations together, GM and TA expanded on fleeting remarks and closed answers by describing their experiences of working in the building and engaging with its users. A discourse surrounding staff and student perspectives of the Mackintosh Building arose from this coalescence of artefact, image, text, and speech.

Optimistic that participants will complete the tools indefinitely, the toolkits lead designers to believe that a remote application of probes yields qualitative data to uncover design requirements. At the same time, they do not equip designers with an alternative strategy should participants lack motivation, fail to fathom the tools, and subsequently return them incomplete (Lee et al. 2011: 106; Hanington and Martin, 2012: 54–56; Helen Hamlyn Centre for Design, 2013; The Design Council, 2013). In response, I think of design probes as both remote and direct devices that offer ample, flexible opportunities for engagement and participation (Broadley and McAra, 2013).

6. Tools to analyse participatory content and tone

The toolkits expound innovative methods to help designers gather insights, generate ideas, and reach consensual decisions. Meanwhile, the techniques they present to assist in evaluation, interpretation, and analysis overlook the experiential information that is evoked when the designer interacts with participants and tools (Tassi, 2009; Hanington and Martin, 2012: 40–41, 196–199, 202–203; HCD Connect, 2013).

Mattelmäki concedes that probe returns may be perceived as 'too ambiguous and fragmented with too broad a focus to be used for concrete design decision-making in companies' (2006: 206). Yet, as Gaver et al. elucidate, uncertainty is inherent in interpretation and often gives rise to serendipitous new concepts (2003: 235). On the whole, the literature observes the probes' capabilities to inform and inspire design solutions (Mattelmäki and Battarbee, 2002: 271; Gaver et al., 2003: 240; Mattelmäki, 2006: 172; Lucero et al., 2007: 390–391; Graham and Rouncefield, 2008: 196; Lee et al., 2011: 109–110). Remaining sceptical of an elusive and inaccessible motivational force, designers Andy Crabtree, Terry Hemmings, Tom Rodden, Karen Clarke, and Mark Rouncefield maintain that inspiration stems from the ethnographic information collected by the probes (Crabtree et al., 2002: 50). As I revisit later in this chapter, the methodological parallels drawn between human-centred design and ethnography focus predominately on data collection and largely neglect the analysis of design-led dialogue (Frankel, 2009: 3507, 3509). Compiling a taxonomy of design probes, Ben Matthews and Willem Horst (2008) attribute Gaver et al.'s artist-designer propensity with a philosophical reorientation of human-centred design research, in which visual and participatory tools and techniques are reappropriated to investigate the discipline itself on a metalevel (Gaver et al., 1999: 24).

To develop these analytic discussions, I recommend that designers assimilate the experiential nature of human-centred design phases and activities with the concepts gleaned from their tool returns. My reflexive analysis of critical events

and insights within the autoethnographic drawings supplemented discrepancies in the tool returns, incomplete responses, and my connotative interpretations. This visual mode of analysis communicated and formalised data that was otherwise ephemeral and lost. Materialised as expressive and aesthetic renderings, the designer's experience and position offers a primary source of inspiration, ready for opportunities and propositions to be extracted.

Evaluating students' perceptions of their roles in the design process, Ho and Lee explicate that viewing designers as problem-solvers, craft makers, active citizens, and opportunistic entrepreneurs perpetuates hierarchies in human-centred design relationships, and instead, advocate 'pre-reflexive being' as a mindful stance that can strengthen their bonds with participants (2013: 570). Placing impetus on acts of probing, priming, understanding, and generating through creative methods, Sanders et al. value the designer as a visualiser, maker, ethnographer, facilitator, and analyst (2010: 2). Moreover, Mattelmäki's investigations of design probes acknowledge creative intuition, inspiration, and decision making in the hands of the designer (2006: 59). I go on to examine the role of the human-centred designer in light of a participatory, reflexive, visual, and material practice.

Not turning a blind eye: navigating roles and responsibilities as a multifaceted human-centred designer

Dorst believes that desires to rationalise design processes have overshadowed designerly skill and agency and dismiss the practitioner as the 'missing person in design research' (2008: 8). An enthusiasm for processes, tools, and techniques suggests that designers perform reductive and generic activities, regardless of their areas of expertise or the specificity of the design setting:

The overwhelming majority of descriptive and prescriptive work in design research focuses on the design process, to the exclusion of everything else. Therefore the design methods and tools that are being developed inevitably focus on enhancing the efficiency and

effectiveness of design processes. And apparently, this total ignoring of the design content, the designer and the design context allows us to claim that we are constructing models, methods and tools that will be valid for every designer, dealing with every possible kind of design problem, in any situation.

Dorst, 2008: 5

I develop Dorst's views to challenge the diagrammatic design process models on the grounds that they mask the complexities of practice. Similarly, the toolkits' collective efforts to provide purposive repositories of methodological tools and techniques discount the experiential impact of participatory interactions on the designer's intuitive reasoning. These concerns denote reflexivity as a means of 'constructively combin[ing] practice and analysis and to be honest about ...[the] dual role of working in as well as studying the project' (Steen, 2008: 69). Drawing from the transformation of sociomaterial practices across the five methodological stages and borrowing from the 'designer as...' approach adopted by Kelley (2008), Inns (2010), and Tan (2012), I propose the ethnographic explorer and storyteller, visual maker, strategic and empathic facilitator, and intuitive interpreter as pivotal roles for the human-centred designer.

Designer as ethnographic explorer and storyteller

The IDEO Method Cards feature 'rapid ethnography' as a tool for designers to engage with users in their natural environments (IDEO, 2002). With affiliations to the innovation consultancy, both Kelley and the HCD Connect toolkit urge the anthropological designer to suspend their existing knowledge and adopt a 'beginner's mind' (Kelley, 2008: 17; HCD Connect, 2013). Adhering to the ethnographic basis of observation, engagement, and interpretation, I consider myself as neither a complete outsider nor a completed insider, but as an iterative composite of these two membership roles as I alternated between stages and studies (Hanington and Martin, 2012: 124–125).

Glasgow Museums' displays of souvenir brochures and commemorative ceramics from Rothesay's heyday were fresh in my mind as I explored the town's environmental and sociocultural decline (Glasgow Museums, 2013). My mother's recollections of family ancestry inspired my investigations of Islay's heritage through the eyes of its residents. I had witnessed visitors congregating around and within the Mackintosh Building, but as a design student, I had never worked in the building myself. These tacit insights inspired the introductions I made to the participants, materially and verbally.

I challenge the objectivist stance that the researcher's previous experiences be bracketed and concealed in order to discover authentic cultural truths (Kelley, 2008: 17; HCD Connect, 2013). As Gunn attests, a refutation of subjectivity bypasses the intersubjective sociocultural data that materialise when sharing visual, written, and verbal stories with participants as a way of becoming (2007: 107–108). Narrative remains a prevalent theme in human-centred design, yet a separation of the anthropological designer as observer from the storytelling designer as reporter neglects the insights to be gained from combining learning and interpreting in the exploratory process (Kelley, 2008; Brown, 2009; Quesenberry and Brooks, 2010; Hanington and Martin, 2012: 68–69; HCD Connect, 2013). Leaning towards a reflexive participatory approach, design ethnography values concurrent understanding and intervening to build empathic human relations in the field (Battarbee, 2006: 66, 130; Halse, 2008: 22).

I recommend an ethnographic identification with participants by appropriating the designer's subjective experiences as mutual storytelling tools. Blending encounters, observations, and reflections gleaned from orientation confirmed the gaps in my knowledge, and the experiential drawings offered a methodological key to unlock discussions from an insider perspective. The empathic insights I experienced with the Islay pupils were grounded in our visual, written, and verbal telling and retelling of subjective stories. My intention is not to limit ethnographic investigation to the orientation or analytical stages, nor do I attach a specific tool or technique to data collection, participation, or interpretation. Rather, I advance

autoethnographic tenets in human-centred design practice by transmitting the designer's aesthetic sensibilities to 'evoke response, inspire imagination, give pause for new possibilities and meanings, and open new questions and avenues of inquiry' (Ellis, 2004: 215). In adjusting to the intricacies of orientation, participation, and interpretation, a visually reflexive storytelling perspective strengthens this notion of the ethnographic designer.

Designer as visual maker

Images and artefacts mediated orientation, participation, evaluation-in-action, and tool response analysis, and provided the foundations for reflexive analysis. As I set out in chapters one and two, the human-centred designer's practice as a visualiser oscillates between their considered creation of rendered drawings as design outputs, and transitory sketches to augment the process (Bedell, 2005; Burns et al., 2006; Brown, 2009). Arriving at the crossroads of fine art and product, environmental, and communication design, Norman Potter relegates designers' drawings as informational devices that exist purely as 'outcome, acquiring the false-dignity of an end-product in the process' (1980: 21–22). Here, the designer is prescribed as a detached, dispassionate, but competent problem-solver who makes graphic representations of design solutions. Tan, on the other hand, subverts Potter's restrictive compartmentalising to champion the liberal application of images as projective, ideational, and generative tools (2012: 82, 143). Despite interspersing visualisation in the wider body of her thesis to assert the designer as a co-creator, researcher, facilitator, capacity builder, social entrepreneur, provocateur, and strategist, Tan disregards designerly expression as a tool to stimulate participation and the effect this has on knowledge construction and the designer's role.

I conveyed personal understandings and professional goals to my fellow designers and to the participants by showing them my photographs, drawings, sketched notes, concept maps, and visual and material prototypes. Elevating the

status of methodological images and artefacts, I challenge refusals of artistry in design and reinstate aesthetic tool creation as an intrinsic skill possessed by the human-centred designer (Alexander, 1964; Goldschmidt, 2003; Brown, 2009; Tonkinwise, 2010; Eckert et al., 2010). In line with Fabian Segelström's deductions of visualisation in service design (2009), my methodological framework enabled my self-reflection and my communication with others, subsequently achieving a human-centred empathy in our relationships. The creative techniques I used and the participatory tools I created sustained iterative phases of data collection and analysis. Encompassing designed artefacts as embodiments, carriers, and mediators of interdisciplinary, intersubjective insights, the designer's ongoing role as a visual maker serves to 'keep data alive' (Segelström, 2009: 179).

Designer as strategic and empathic facilitator

My autoethnographic visualisations of critical events points toward the human-centred designer's strategic position as a coordinator and problem-solver (Inns, 2010; Tan, 2012). As barriers and constraints are inevitable in socially situated research, I do not view these roles as unique to the discipline. Instead, I accentuate the emotional hurdles that the designer negotiates in the facilitator role. In chapter one, I describe facilitation as the designer's directorial structuring and leading of participatory and collaborative activities (Siu, 2003: 64; Burns et al., 2006: 26; Thackara, 2006: 6; Morelli, 2007: 6; Julier, 2007: 208; Sanders and Stappers, 2008: 13–14; Manzini, 2009: 11). Opposing the seemingly impartial researcher as a trainer rather than a player, I argue that facilitators are immersed, relational, non-neutral agents. When designers exploit their dual role as facilitators in the human-centred process and participants in the sociocultural setting, their engagement with users and stakeholders is open, empathic, and revealing (Buur and Larsen, 2010: 137).

I facilitated the Rothesay consultation sessions by making the *Visual questionnaires*, logistically planning times, locations, and necessary resources,

setting up the workshop space, and explaining the tools' rationale and wider project to the residents. These activities can be thought of as strategically enhancing the residents' awareness of the research and their physical encounters with the tools. Extending the reflexive stance, my divergent and focused discussions with the residents provided opportunities to deviate from the practicalities of facilitation and engage with them as a visitor to their town. Backed up by the *Visual questionnaires*' open-ended imagery and questions, the residents were empowered to supplement my observations of Rothesay's empty town centre, fading nostalgia, and overwhelming dereliction by sharing stories of living in the town and witnessing its gradual decline before their eyes. The designer's position as both a strategic and empathic facilitator initiates dialogue through which the experiences of participants are envisioned as a repository of information and inspiration (Gaver et al., 2003; 2004; Mattelmäki, 2006).

Designer as intuitive interpreter

Images, artefacts, and experiential knowledge respectively motivated my simultaneous modes of analysis and the sociomaterial practices within each case study. When creating the tools for participation and imbuing them with my own artistic style, I anticipated an eclectic mixture of drawings, text, and speech from participants in response, but was aware that return rates could be low, annotations could be incoherent, and data could be conceptually meaningless (Lee et al., 2011: 106). Sociocultural design settings exist as entanglements of human action and emotion, and as such, human-centred designers must accommodate serendipity through practice and analysis:

The purely analytical models of science that we have been using will only get us so far: in the face of such an immensely complex area as design, only experimental methods can bring the clarity and understanding we are seeking. We need to re-engage with practitioners, and get involved in experiments within the rapidly changing design arena. Design researchers should join design practitioners in co-creating the design expertise and design practices of the future.

Dorst's aspirations towards a paradigmatic realignment of practice and research affirm the designer's prevailing visual literacy and intuitive interpretations as legitimate modes of analysis. The experimental methods he speaks of concur with the five-stage participatory-reflexive methodology's ability to support designers in devising and structuring tools and techniques to engage with others, whilst acknowledging and applying their own expertise and intuition. This reflexivity is negotiated to some extent by Schön's reflection-in-action (1983) and Steen's behind-the-scenes approach (2008: 205). However, the term reflexivity itself is somewhat abstract and inaccessible when confined to individuals' internal thought processes (Steen, 2012: 14). Elaborating on Steen's brief considerations of design probes (2008: 43–44), Gaver et al.'s (1999; 2003; 2004) and Mattelmäki's exploratory investigations have had an enduring legacy in alluding to visually reflexive modes of analysis:

Material intended for inspiration need not be handled by means of scientific analysis or require generalisations. Interesting issues, themes, patterns and their exceptions are raised, which may be elaborated further by association and storytelling concerning them. The results of probes intended for inspiration are typically presented through authentic material, physical objects and ideas, in the manner of cultural probes.

Mattelmäki, 2006: 59

The autoethnographic drawings allowed me to examine my experiences of the human-centred design process and illuminated the key modes of engagement fostered by the visual and participatory tools and techniques. My narrative interpretations of the case studies accommodate Ho and Lee's notions of the 'It-Thou' relationship, in which designers attempt to dissolve hierarchical barriers and embrace empathic engagement with participants. Attending to the drawings' content, the sociomaterial practices they depict signify my movement between the studio and the field, and my situated interactions with tools, techniques, participants, and collaborators. This intersubjectivity corresponds with the unified synthesis of entities characterised by the 'I-Thou' relationship (Ho and Lee, 2012: 82).

Questioning artistic and designerly research processes as new knowledge in themselves, Biggs asks 'what content have we gained as a result of an experience once the immediate feelings and sensations have passed?' (2007: 195). To respond, the autoethnographic drawing technique and the tools this produced enriched my understanding and communication of insightful moments of dialogue. Concepts of community division and cohesion and organisational imbalances were interpreted, reluctance and resistance were encountered, and rapport, camaraderie, and playfulness were enjoyed. The designer's role as an intuitive interpreter advances observations of their materially mediated exchanges with participants and collaborators (Wahl and Baxter, 2008: 75; Eckert et al., 2010: 35). The transdisciplinary character of the five-stage participatory-reflexive methodology offers an epistemologically enlightening way to interpret the complex arrangements of data that emerge when undertaking exploratory human-centred design practice and research.

Designer as user; designer as toolkit

Consolidating my discussions of orientation, intuition, inspiration, and intersubjectivity, I conclude this chapter by cementing the designer's role as a user and as a mediatory form of toolkit. I integrate these as the optimum positions for the human-centred designer within the five-stage participatory-reflexive methodology.

A greater degree of empathy and understanding is reached with participants when designers apprehend and question their own subjectivities. *Rural Legends* established a connection with the Islay pupils without didactically instructing them to annotate the postcard as a form of homework. In the workshop, our displays of compassion and subjective involvement created a dialogue where pupils felt comfortable to divulge their personal experiences. Camaraderie was introduced by the lively participation of the packs and sustained by our presence as inquisitive visitors to the island. To incite an intersubjective dialogue, the *Building*

Observations logbook was ascertained from my student-user perspective of the Mackintosh Building tours. The tour coordinators called upon their knowledge of working in the building to counter my personal interpretations visible in the drawings.

The suggestive and imaginative questioning of the *Islay pre-pack* and *Islay workshop pack* contrasts *Building Observations'* critical reflection, and echoes the opposing relationships formed during the workshop and the interview. While we entered into an empathic conversation with the high school pupils, I experienced a hierarchical division between myself as a student, and the tour coordinators as GSA staff members. My interactions with the design students in *Building Experiences 3*, however, were more akin in atmosphere to that of the *Islay* workshop: democratic, exploratory, amenable, and insightful, on account of both our shared experiences and the playful nature of the tools and techniques. The specificity required when designing such tools and techniques corroborates the five-stage participatory-reflexive methodology's recommendation that designers become immersed in the field, assume a user persona, envisage their experiences and their observations of others, and gain an authentic understanding of the setting for themselves (Broadley and McAra, 2013).

Appropriating Ivan Illich's conceptions of 'convivial tools', I tried to provide 'each person who uses them the greatest opportunity to enrich the environment with the fruits of his or her vision' (1973: 34). Developing this point, my tools can be criticised as 'industrial tools', whose predetermined function and objective, evidenced by their designed graphic qualities and question-and-answer format, restricted the participants' full and open expression (Illich, 1973: 34). Yet, as I analyse in chapter four, our interactions promoted varying positive and negative responses in accordance with the dominant and underlying modes of engagement, revealed insightful sociocultural perceptions and experiences, and effectively advanced the human-centred design process. Committed to constructing a 'mental image of the user', our team's desires to exchange and co-create knowledge were made possible by bonding with the *Islay* pupils (Mattelmäki, 2006: 50). Conversely,

conflicting objectives to generate financial revenue and explore methods of visitor engagement surfaced in the interviews with GSA Enterprises, brought to light an air of hostility, and finally confirmed our lack of consensus. These 'crossing intentions' and my subjective transparency as a facilitator proved a productive element in design participation that drove me to recruit the students for the co-design workshop (Buur and Larsen, 2010: 129, 137). Dialogue and consensus were exposed here in their richest forms. As users of the Mackintosh Building and GSA at large, we visually shared our experiences and interrogated discrepancies and crossovers to underpin the students' design proposals.

With the tools by my side, I conveyed my enthusiasm and subsequent disappointment to the Rothesay residents, explaining that I had hoped for so much more from their town. I told the Islay pupils my mother's story, using Glaswegian slang and improvising intuitively. Describing my observations of rule breaking and ineffective translation sheets, I gave GM and TA an honest critique of the tour service. The chronological development of the tools across the three studies evidences my progressive modification of their communicative properties. The *Visual questionnaires* were graphically and textually explicit in their asking of questions, and thus collected a wealth of material responses. The *Islay pre-pack* and *Islay workshop pack* possessed more compositional space and were consistently contextualised by our team's written and verbal encouragement. In being highly subjective and expressive, the *Building Observations* logbook and the *Mack-it notes* documented GM and TA's brief comments. They then prompted a deep discussion, as did the *Prototype foreign visitor feedback tools 1, 2, and 3*. Consequently, in granting the latter tools the freedom to take over in both interviews, I gave them too much agency and became disempowered. As Illich concludes, 'a tool can grow out of man's control, first to become his master and finally to become his executioner' (Illich, 1973: 99). By reconfiguring the phases and activities within my five-stage participatory-reflexive methodological compass in the *Building Experiences 3* workshop, the structured and sparse user profiles and break-up letter templates were simplified into blank sheets of paper for storyboard and prototype visualisation. This confirms my gradual foregrounding

as I regained my voice and used the tools to illustrate and mediate the students' participation.

My analyses and extrapolation of critical events and insights derived from my application of visual and participatory tools in the case studies affirms a specific appropriation of reflexivity that is capable of enriching exploratory human-centred design as a creative and communal practice. Recalling my discussions in chapters one and two of the diversification of design from the positivist solution-focused roots of the Design Methods Movement towards a socially situated exploratory human-centred domain, the discipline's broad neglect of reflexivity can be attributed to a favouring of practitioner objectivity over emotionally responsive and empathic practices (Mitchell, 1993; Moore, 2010). However, in questioning its ubiquity in design research, Kimbell (2013) suggests that empathy has been fetishised to the extent that practitioners and researchers seeking to understand the experiences and needs of user and stakeholder participants have lost sight of a human-centred design rationale.

Examining dualities of cognitive and affective empathy, New and Kimbell (2013) distinguish between the designer's ability to imagine and describe user experience in a speculative sense on the one hand, and to actively adopt a user persona and invest in their experience through 'emotional labour' on the other (2013: 144). Rather than being a rationalistic prerequisite that is actively forged in an attempt to undertake a 'dumbed-down version of ethnographically-informed research', the mode of aesthetic empathy is mutually experienced by designers and participants through their dialogic and sensory interactions (Kimbell, 2013). Acquiring a reflexive awareness of the design context and project aims is essential for designers in building productive and meaningful relationships with participants, but as New and Kimbell allude to (2013: 146–147), current toolkits of methods thought to stimulate empathic connections are standardised and limited, and are thus more in line with the rigidity and rationality of the cognitive model, in which data and outcome overshadow engagement and understanding.

As I encountered through my immersion in the case study settings, my engagement with participants, and my analyses of information and interactions, a constructivist and jointly participatory and reflexive approach to human-centred design practice supports designers in being mindful of and sensitive to the experiences and needs of user and stakeholder participants on both a fundamentally social level as a user-participant in themselves, and as a multifaceted practitioner-researcher capable of envisaging preferred future products, services, and systems. Distinguishing this from reflexivity in ethnographic research that acknowledges the contextual impact of the researcher, and as a broader implicit element of human consciousness (Giddens 1998; Davies, 2008; Pink, 2009b), the five-stage participatory-reflexive methodology and the accompanying recommendations and roles prompt the human-centred designer's reflexive appropriation of visual and participatory tools and techniques to render the multiple experiences of each associated human actor tangible and accessible, thus enhancing productive dialogue and communication. Whilst corroborating Steen's belief that reflexivity allows human-centred designers to manage their dual roles as practitioners and analysts (2008), this particular designed variant supports the formation of equitable, balanced relationships that are pivotal to the subsequent co-design and developmental stages, and lead to the implementation of truly human-centred outcomes.

I propose the *designer as toolkit* formation as an innovative placement in human-centred design. Exploring, subverting, and testing the application of my creative visual practice has supported these investigations of design methodology, participant engagement, and designerly roles in respect of reflexivity. As the personification of the tools they create, the designer as toolkit implicates Tom Holert's notion of the designer's (un)accountability through a distributed agency (2011). My repositioning of individual artistry as a socially situated practice affords the human-centred designer as the primary driver of participation and develops design as 'happening in hybrid assemblages (or networks) of human and non-human, of institutional and individual actors, and not in the exclusive loneliness of an imaginary designer's studio' (Holert, 2011: 25–26). Responding to a

mutable agency shaped by the intersubjective relationships of people and things (Orlikowski, 2010: 14), the tools and techniques that I made, used, and interpreted were invaluable as my co-designers and co-researchers. As their creator, I attest the human-centred designer's overarching role as a holistic, flexible, receptive, and multifaceted toolkit.

Working within its framework of orientation, participation, and evaluation-in-action as stages of data collection, I reappropriated research methods originating from the wider social sciences (secondary desk research, questionnaires, focus groups, interviews, member checking), and ethnography (participant observation, fieldnotes, graphic elicitation) and combined these with existing tools and techniques from the broader field of human-centred design practice and research (participatory and co-design workshops, design probes, personas, scenarios, prototyping, conceptual mapping activities). These three stages can thus be thought of as having an affinity to the initial divergent phases of human-centred design processes, as I acknowledge in my evaluations of the process models (Koen et al., 2002; Mattelmäki, 2006; The Design Council, 2005; 2007b; Sanders and Stappers, 2008; Hanington and Martin, 2012). However, in being embedded in my own creative practice through observational visual reportage, experiential drawing, illustrative mapping, and expressively representating interventions, my data collection was characteristically reflexive and participatory. Its scope allowed me to holistically integrate my subjective encounters, experiences, and knowledge as the central designer and researcher into my engagements with settings and participants to gather insights and illuminate innovative design opportunities.

In tool response analysis and reflexive analysis I borrowed extensively from social scientific content analysis, mixed methods, autoethnography, and narrative inquiry in order to formally evaluate and interpret the information gathered via my tools and techniques for data collection and to understand how their content, format, and tone impacted upon the relationships I formed with participants. Within these modes of analysis in the context of human-centred design exploration, the omnipresence of my practice and reflexive position supported my research aims'

and question's focus on the human-centred designer's role within and impact on participatory relationships, and enhanced my ability to balance my own subjectivity with the insider knowledge of the participants. As such, my development, application, and evaluations of the five-stage participatory-reflexive methodology provides a detailed critique of existing processes and methods in human-centred design by underlining an overarching neglect of the designer's situated position and practice.

Simultaneously, by undertaking a reflexive visual approach to participatory human-centred design practice and making tangible my interactions with settings, participants, collaborators, tools, and techniques, I maintain that the five-stage participatory-reflexive methodology functions as the original contribution to knowledge due to its transferable applications. My position, my practice, and the sociocultural specificity of each case study setting determined the tools and techniques arranged within my five-stage participatory-reflexive methodological compass. I do not, therefore, advocate their direct replication by other human-centred designers. In setting out the principles governing the constructivist paradigm, Lincoln and Guba explain that tacit constructions can be imported, reconstructed, and applied in different settings to generate working hypotheses (2013: 72). As such, the participatory-reflexive ethos of the methodology's five stages provides a framework for designers to engage with users and stakeholders whilst utilising their subjective experiences and expertise. Orientation, participation, evaluation-in-action, tool response analysis, and reflexive analysis are open and adaptable. By following the six recommendations for making, using, and interpreting tools and techniques, and acknowledging their personal positionality and agency, human-centred designers can devise and implement responsive and innovative modes of data collection and analysis and engage with participants to build productive, sustainable relationships in the exploratory phase of the process. Encouraging practitioner-researchers to recognise their impact in and on the exploratory process, this practice-led research has provided a transparent, intimate, embodied narrative account of human-centred design methods, relationships, and roles.

CONCLUSION

Human-centred design exploration: eliciting information and building relationships

The textual thesis and portfolio of practice work in tandem to address the research aims and answer the research question. My central aim was to understand how designers can use their creative practices to devise methods capable of generating information and establishing relationships with user and stakeholder participants in the exploratory phase of the human-centred design process. Following this, I simultaneously explored the designer's methods for gathering insights, generating ideas, and making decisions, and their particular aspects and attributes that help foster understanding, empathy, rapport, consensus, and dialogue in human-centred design relationships. Encompassing the research question, I positioned my own illustration and design practice as the central driver of the investigation to examine how the content, format, and tone of visual and participatory tools and techniques can support designers in balancing their own subjectivity with the experiences and needs of participants, and the designer's reflexive competencies to build productive social bonds in the design team.

Drawing from participatory design discourses in chapter one, I defined participation as a performative event in which tools and techniques are tested, social relations are born, dialogue is instigated, and stories are exchanged. I considered how a selection of diagrammatic models present the design process as distinct stages, and evaluated a range of human-centred design toolkits that classify and promote experimental methods to elicit participants' feelings, needs, and desires. Collectively, the design process models and the toolkits mask the complexity of exploratory human-centred phases and activities, do not account for serendipitous changes in direction when designers interact with user and stakeholder participants, limit methodological innovation through practice, and suppress the designer's agency. Examining ethnographic principles, I developed debates surrounding applied visual anthropology and

identified researcher-created images as devices that support the graphic elicitation of participants' responses. In turn, I proposed that designers possess an innate visual sensibility and a reflexive aptitude for stimulating dialogue with participants that are not fully realised or exploited by established methods in the discipline. Aligning human-centred design activities with a sociomaterial assemblage of designers, participants, tools, and techniques informed my emergent methodology.

In chapter two, I set out the five-stage participatory-reflexive methodology as a framework for carrying out exploratory practice-led human-centred design research. Underpinned by a constructivist philosophical stance, this views the process as a socially situated, culturally specific, and materially mediated construction in which knowledge is construed intersubjectively via the designer's interactions with settings and participants. A closer interrogation of participatory design corroborated the application of interpretative, hermeneutic, and dialectic methodologies in design research. Structuring my own participatory-reflexive methodological compass with stages of orientation, participation, evaluation-in-action, tool response analysis, and reflexive analysis, I positioned my bespoke tools and techniques within three case studies set against contexts of environmental, community, and organisational placemaking (Fig. 15).

Methodologically triangulating stages of data collection in chapter three, I described the orientation, participation, and evaluation-in-action stages in each case study and directed the reader to the corresponding tools and techniques in the portfolio books and volume of appendices. Orientation through desk research and visual mapping provided a broad overview of sociocultural issues and highlighted suitable users and stakeholders as potential participants. This was followed in the Rothesay and Mackintosh Building case studies by participant observation, which informed collections of written, drawn, and photographic fieldnotes as records of my encounters. As a preliminary visit was not possible in the Islay case study, I undertook an extended period of desk research where assimilated displays of secondary information and anecdotal

conversation provided inspiration. In each case study, orientation culminated in studio-based reflection and my creation of the experiential drawings. Through these tools and techniques, I made sense of my personal experiences and intuitively converged on defined issues, people, spaces, and practices in the participation stage (Port-Ro, Port-Io, Port-MBo; App-Ro, App-Io).

Focusing on areas of Rothesay in need of environmental and social attention, I represented ten key themes as simplified drawings and composed accompanying sets of questions. Forming the *Visual questionnaires*, these were used in a community consultation focus group to gather residents' drawn and written experiences of the town and their ideas for its regeneration (Port-Rp). In the Islay case study, I posted *Rural Legends* to the high school pupils to spark their imaginations and prompt their own drawn narratives on the blank *Story postcard*. These were joined by our student design team's remaining tools in the *Islay pre-pack* and the *Islay workshop pack*, and were subsequently co-facilitated to the pupils in a participatory workshop (Port-Ip). The *Building Observations* logbook presented my thematic series of *Mackintosh Building experiential drawings* as records of observed problems surrounding the building's users and their needs. Along with the *Mack-it notes*, I employed these tools as prompts in a materially mediated interview to garner the GSA Enterprises staff members' written responses and contextualise our exploratory discussions of the visitor experience (Port-MBp). My creation and use of the tools and techniques for participation initiated introductions with users and stakeholders and accumulated qualitative data to inform idea generation and decision making.

In the evaluation-in-action stages I illustrated and organised participants' responses to create the *Rothesay responses concept map*, *Islay responses data evaluation matrix*, and *The Mackintosh Building visual transcript* (Port-Re, Port-Ie, Port-MBe). Reflecting on these tools to locate and propose design opportunities, I noted dominant discussions of Rothesay's environmental and sociocultural decline, the Islay pupils' lively expressions of island culture

and family unity, and GSA Enterprises' lack of feedback from foreign visitors. While logistical constraints prevented me from gathering pupils' feedback on the *Family as Community* proposal, I evaluated *Haste ye Bute's* feasibility and desirability with the Rothesay residents and presented GSA Enterprises with the *Prototype foreign visitor feedback tools*. Recognising problems in the prototypes' content, format, and tone, I identified an alternative opportunity to explore a group of design students' relationship with the Mackintosh Building through the *Building Experiences 3* workshop tools. This evaluation-in-action of the insights and ideas gleaned through orientation and participation informed the direction of the human-centred design process.

I qualitatively identified concepts from the participants' drawn, written, and verbal responses in the tool response analysis stage. Once arranged in categories, aligned in tables, and assessed quantitatively, this data communicated the most prevalent local insights and pointed towards my tools' abilities to elicit participants' unmet needs and future aspirations (Port-Rt, Port-It, Port-MBt; App-Rt, App-It, App-MBt). In making the autoethnographic drawings, I reconstructed my subjective experiences of each case study. A thematic analysis of the narratives displayed in these visualisations allowed me to isolate the critical events in which the interplay of designers, participants, settings, and tools and techniques revealed additional insights, helped generate ideas, and propelled individual and collective decision making. The degree to which my subjective expression was afforded through reappropriating my illustration practice in this mode of reflexive analysis evidences the specific aspects and attributes of my tools and techniques and their consequential abilities to collect data and to strengthen relationships. As such, the recommendations I put forward in chapter five are supported by instances when the key modes of engagement – understanding, empathy, rapport, consensus, and dialogue – were prompted by the materials' content, format, and tone, and supported by my reflexive competencies as an emotionally aware designer and researcher (Port-Rr, Port-Ir, Port-MBr).

Designerly reflexivity: a toolkit for participation

Appropriating my own images and artefacts as methodological tools and techniques across each case study informed my reflexive designerly position and reinforced my secondary research aim to examine the human-centred designer's multifaceted role. Externalising my developing knowledge in the orientation stages activated my personal understandings of the sociocultural settings and promoted my sustained reflection on problematic issues. Once materialised in the aesthetic and open tools, these initiated mutual empathy between the participants and myself: they recognised, augmented, and enriched my knowledge of their world. Facilitated jointly in the Islay workshop and used as generative devices in *Building Experiences 3* with the design students, rapport was stimulated when the tools utilised their playful storytelling capabilities to express my experiences and invite the participants' drawn, written, and verbal responses. As a notable chain of events, our honest and relaxed verbal exchanges enhanced the flow of participation (Port-Ir, Port-MBr).

In the Rothesay and Mackintosh Building case studies I experienced participants' equal reluctance, resistance, tension, and hostility as a result of the tools' material presence. A lack of cohesive visual identity, replicated questions, sensitive imagery, and a naive aesthetic established divisions between myself and the participants and culminated in a lack of consensus. In cooperation with my inquisitive questioning, the *Visual questionnaires*' provocations foregrounded the Rothesay residents' apathy and fatigue surrounding the THI. Yet, those who said they did not have time to complete them or could not due to a lack of drawing ability still engaged in verbal or written dialogue, and in doing so, disclosed their disappointment regarding the town's condition and perceptions of the THI as complacent (Port-Br). The Mackintosh Building tour coordinators continually rationalised the problems I had visualised in *Building Observations* as issues that they were in the process of addressing. Their defensive attitudes signified a justification of the tour service as essential financial support for the school and confirmed

the opposing experiences, needs, problems, and aspirations of visitors, staff, and students (Port-MBr). Through these disputes, the tools shook contentious issues to the surface, revealing conflict and confrontation as productive aspects of design participation.

Dialogues were stimulated and intersubjective knowledge was constructed through these combinations of visual tools, written instructions, and verbal contextualisation. Expanding upon their abilities to evoke such exchanges, the tools supported participants' articulation of issues through complementary modes of communication. The insights amassed from these interactions indicate the five-stage participatory-reflexive methodology's capacity to structure techniques for qualitative data to be recorded, reported, and interpreted as sources of designerly inspiration.

The autoethnographic drawings showcase the *Rothesay experiential drawings*, *Mackintosh Building experiential drawings*, *Visual questionnaires*, *Haste ye Bute prototype*, *Islay pre-pack* and *Islay workshop pack* (containing *Rural Legends* and the *Story postcard*), *Building Observations* logbook, *Mack-it notes*, *Prototype foreign visitor feedback tools*, and *Building Experiences 3* workshop tools as presenters, carriers, and mediators of knowledge (Port-Rr, Port-Ir, Port-MBr). At the same time, they affirm these devices' inability to document a holistic vision of human-centred design processes, experiences, and relationships. The sociomaterial practices visualised in their scenes afforded meaningful insights at the local level of each case study. These were translatable and transferable as the modes of engagement attributed by the tools as epistemic probes (Broadley, 2012d).

Adopting multiple roles throughout the case studies, I sought to concurrently understand and interpret my subjective experiences and the participants' responses. With storytelling inherent in the ethnographic role, I unpacked my encounters of Rothesay, Islay, and the Mackintosh Building through the experiential drawings and relayed these back to participants via the tools to

welcome their reciprocal narratives. As a visual maker, my focus on creative imagery imbued my five-stage participatory-reflexive methodological compass with tools and techniques to externalise the participants' experiences in tandem with my own. Progressing the reflexive position, I negotiated strategic and empathic facilitation by introducing myself professionally as the project coordinator, and personally as a visitor and student. Upon enlisting the tools as my collaborative partners, I verbalised my experiences and sought participants' confirmations, refutations, and elaborations. This formed social bonds, encouraging participants to follow my lead and express themselves through drawing, as well as writing and speech. I intuitively interpreted participants' responses and our interactions via the tools to locate patterns and dominant themes, conceptualise their needs and desires, and distil and define the modes of engagement emerging from our relationships.

While these roles are adapted to meet the demands of different activities, phases, and stages, the designer's practice-led reflexivity is a constant throughout the exploratory process. As the autoethnographic drawings exemplify, when designers make, use, and evaluate visual and participatory tools and techniques, an additional subjective human-centred layer is superimposed upon interpretation. The drawings penetrated the informational veneer presented by the tool returns to unpack the sociocultural conditions surrounding participation: the tone of the relationships, fleeting anecdotal comments, dead ends, and raw emotion that offered an enduring and rich repository of inspiration. As a user of the settings — a visitor, a student — I acquired relational understandings that supplemented those of the participants. I acknowledged these experiences as a partial outsider and in doing so, openly sought the participants' responses. The cooperation of the human-designer and their non-human tools unlocks the intersubjective dialogue embedded in the exploratory process. As dialogue deepened and stories were shared, the tools were muted; they took a step back, and permitted me to take the lead. This ongoing design-led reflexivity permeated my transformational roles as an adaptable, responsive, multifaceted design toolkit, and manifests itself within the five-stage participatory-reflexive methodology as the original contribution to knowledge.

Additional learnings and personal reflections

Extending my recommendations for making, using, and interpreting visual and participatory tools and techniques, methodological innovation for design is essential in sustaining new solutions to complex problems (Frayling, 1993: 5; The Glasgow School of Art, 2013a). Methods become staid and stale as they are recycled. Designers become complacent in their replication of tools, robotic in their facilitation, and expectant in their evaluations. The qualities of design probes are present across my case studies, yet each permutation of tools was tailored to match my perceptions of the participants and the local contexts of inquiry.

Environmental, community, and organisational placemaking operated as concepts to frame my case studies. Discussed briefly in the thesis introduction, my engagement with rural communities through visual and participatory methods resonates with the Institute of Design Innovation's applications of human-centred design tenets to improve sociocultural stability in Scotland (The Glasgow School of Art, 2013a). The proportion of Rothesay residents resistant to the THI's consultation illuminated a wider need to reconfigure methods for community placemaking. Meanwhile, the methodology's application in the Islay case study underpinned my investigation of young peoples' perceptions of cultural and community identity, while its adaptation in the Mackintosh Building case study demonstrated the transferability of visual and participatory methods with staff and students across GSA. Forming the sociocultural lens of my research, I was unable to interrogate the intricacies of design-led placemaking and community wellbeing to a greater extent.

The ethnographic concepts surrounding the five-stage participatory-reflexive methodology helped situate the autoethnographic drawings as tools for reflexive analysis. My investigations of design and ethnography throughout the thesis underlined the two fields' synergy, but indicated discrepancies in analytical methods and underdeveloped notions of learning and interpreting as

a dual activity (Battarbee, 2006: 66, 130; Halse, 2008: 22). I built on Frankel's recommendations (2009) that human-centred designers incorporate descriptive ethnographic analyses and rigorously align data collection, creative practice, and interpretation to strengthen their communication of design opportunities. In not just borrowing from ethnography but embracing and embedding reflexivity in human-centred design, uncharted modes of analysis can be devised to interpret intangible sociomaterial practices and construe cultural insights beyond the drawn, written, and verbal responses that participants provide.

A pivotal reflection concerns my experience of participatory and collaborative activities from the perspective of an independent PhD student. I found that the participants were, on the whole, less convinced by the research when it was promoted as part of a student project and struggled to fully appreciate my commitment to sharing cultural understandings and future aspirations with them. Comparing my facilitation of the Islay workshop with the MDes students to undertaking the Mackintosh Building interviews alone, elaboration, empathy, and rapport occurred more naturally in the presence of two or more designers. This may be due to the added security of consensual collaboration, but I suggest that participants perceive collective teams in a more credible light, which in turn, renders designers at ease and creates equilibrium in dialogic exchanges. Recalling my introductory experience in the design masterclass and my fifth recommendation in chapter five, inter-team collaboration promoted a rapid interrogation of hunches and internal questions, integrating diverse skills and voices able to share ideas and delegate responsibilities (Burns et al., 2006; Brown, 2009; Burns, 2011). Isolated personal reflection enriched my reflexive stance, but cooperating with other design students grounded the case studies in real life. To reappropriate Steen's views of reflexivity (2008: 69), this accentuates my triangulated role of working in the project as a designer, studying it as a researcher, and all the while learning about human-centred design in action as a practice-led PhD student.

Limitations of the five-stage participatory-reflexive methodology

In chapter five, I affirmed that the five-stage participatory-reflexive methodology's subjectivist foundations enhance its adaptation by other human-centred designers. In turn, I advocated their identification with the six recommendations when making, using, and interpreting visual and participatory tools and techniques. Asserting that the constructivist paradigm cannot impose objective criteria to ensure rigour, Lincoln and Guba present five authenticity criteria (2013: 70). These judge the extent to which the research has rendered researchers' and participants' constructions transparent (fairness), how their constructions have developed (ontological authenticity), how they gained a deeper understanding of each other's constructions (educative authenticity), how the research opens up opportunities for action and innovation (catalytic authenticity), and motivates others to interrogate its findings (tactical authenticity). Following these standards, I point out weaknesses, shortcomings, and limitations surrounding the five-stage participatory-reflexive methodology.

The case studies' directions were subjectively shaped in the orientation stage. Although in the Rothesay case study I considered the MDes students' routine methods, the research aims and question did not provide scope to test the methodology with other designers, to evaluate how their experiential knowledge inspired the process, or to examine designers' attempts to remain neutral and detached from participants and settings. My initial objective in the Mackintosh Building case study was to explore my own images' and artefacts' abilities to highlight problems, opportunities, insights, needs, and themes with the stakeholder staff. However, my direct translation of personal encounters through the experiential drawings can be seen as endorsing an interview that was shaped solely by my subjective interpretations of the tour service and visitor experience.

The tools' content, format, and tone impacted upon my interactions with participants in positive and negative ways. This implicates ontological

authenticity through fostering transparent dialogue, an equitable co-evaluation of designers' and participants' developing insights, and the designer's reflexive and 'introspective statements about their growth' (Lincoln and Guba: 2013: 71). Due to their large quantity of questions, predetermined template formats, and subjective tone, the tools could be criticised as overwhelming and inhibiting participants whilst seeking confirmation of my assumptions. Again, there was not scope to test if more objective and neutral tools could have alleviated such difficulties. Participant samples were small, restricted, and chosen opportunistically in response to the case study aims and the access I attained. In turn, each group comprised individuals with similar characteristics: Rothesay residents with an awareness of the THI, first year pupils from Islay high school, two female staff members from GSA Enterprises, and nine design students from GSA. Further research would aim to engage with a larger cross section of participants and collect more extensive data sets, permitting me to later locate connections and discrepancies between each group as a wider representation of the case study communities.

In the Islay case study, the diverse opportunities the design team devised emphasises the insights that can be construed through the designer's critical interpretations. However, our interventions manifest singular voices amongst many. In pursuing the *Prototype foreign visitor feedback tools* as a collaborative design opportunity, I attempted to balance my own objectives with GSA Enterprises' goals. In spite of this, their desires to alter and pilot *Prototype foreign visitor feedback tool 1* stretched the research boundaries and prevented my engagement with the building's visitors. The *Building Experiences 3* workshop transcended participation and moved towards collaboration, yet my focus on the exploratory stages of the human-centred design process restricted further development of the students' prototypes. Furthermore, as an assimilation of multiple responses, the prototypes, storyboards, and scenarios I presented for co-evaluation were produced rapidly and intuitively to demonstrate the potential evolution of the human-centred design process and to prompt further dialogue. Encouraging participants to refute my interpretations and elaborate

on their personal experiences, evaluation-in-action upholds fairness and educative authenticity in data collection by producing constructions based on intersubjective insights (Lincoln and Guba, 2013: 70–71).

Catalytic authenticity determines 'the extent to which action (clarifying the focus at issues, moving to eliminate or ameliorate the problem, sharpening values) is stimulated and facilitated by the inquiry' (Lincoln and Guba, 2013: 70). Evaluation-in-action was indeed capable of advancing the human-centred design process, but it did not assist in rectifying logistical difficulties or 'assigning responsibility and authority' for piloting and iterating interventions with users and stakeholders (Lincoln and Guba, 2013: 71). In tool response analysis, I gleaned emergent insights and presented these in the tables as an accessible and transparent joint construction. However, by aggregating data and drawing broad inferences, I largely bypassed the sociocultural position of each participant and did not thoroughly interrogate the layers of denotative and implied meaning signified by their responses. Supported by psychologist Patricia Bazeley's discussions of mixed methods for data analysis (2004), I acknowledge the problems associated with qualitatively identifying concepts and categories before summarising these results quantitatively. Combining intensive hermeneutics and statistical inferences entails a 'trade off' where neither method is applied with sufficient rigour (Bazeley, 2004: 148). Yet as Lincoln and Guba contest, while qualitative modes of analysis dominate constructivism, quantitative methods can substantiate the researcher's claims surrounding an element of construction (2013: 69). My qualitative and quantitative analyses demonstrated the depth of data and the dominant insights revealed by the tools, thus suggesting further actions to extend the research beyond these exploratory stages.

The investigation's boundaries did not allow me to verify the analytic findings with participants or to interrogate their parallel experiences further. Rather than engaging in an iterative cycle of feedback and testing, the aim of the research was to understand how information is construed when images and

artefacts are created and used as methodological tools and techniques, the relationships these help form with participants, and the fluctuating roles of the designer in light of such exchanges. My modes analysis may be criticised as biased, selective, and motivated by my subjective positionality. To the contrary, I maintain that the designer is the primary driver in human-centred design exploration. Reflexive analysis is introspective and subjectively selective. The replication and transferal of my sensory experience is therefore not achievable, but is reconciled by my promotion of the methodology's five stages as a framework for other designers to develop and evaluate their own tools, techniques, and philosophical worldviews. I realise that my subjective interpretations of tension and hostility could arouse feelings of discomfort in the reader. However, I advocate such descriptive, reflexive accounts as enhancing the designer's self-awareness and legitimising experiential visualisations as sources of data and tools for practice-led human-centred design analysis. While the research did not advance tactical authenticity at the local level of each case study, the five-stage participatory-reflexive methodology seeks to stimulate practitioner-researchers to test its application in relation to their subjective design practices (Lincoln and Guba, 2013: 70). Proposing an innovative trajectory into, through, and for human-centred design exploration, this research has sought to perceive, interpret, reconstruct, and understand.

An audience for the research

Practised and written from my perspective, this research aims to inspire design students when making the leap from education to professional practice and academic research. I offer a personal account of my human-centred design explorations and communicate the stumbling blocks I encountered when choosing methods for data collection, engaging with settings and participants, and navigating complexity and ambiguity in evaluation, analysis, and interpretation. The five-stage participatory-reflexive methodology seeks to enlighten designers from craft or materials-based disciplines who are

developing their practices in diverse sociocultural settings. As a practising illustrator, I believe that visual making skills enrich human-centred design by rendering dialogue and participation tangible. At the same time, the thesis and portfolio present an accessible vision of inclusive, expressive, and discursive community consultation to placemaking initiatives, local and national policy makers, and creative enterprises pursuing design principles (Broadley, 2012e). By integrating concepts of ANT, practice theory, and sociomateriality, my interwoven discussions of designed images and artefacts and human and non-human agency may also be of interest to the field of organisational studies (Broadley, 2012d). Primarily, I invite human-centred design practitioner-researchers to apply, adapt, and challenge the recommendations I propose, the phases, activities, tools, and techniques within my five-stage participatory-reflexive methodological compass, and my definitions of the multifaceted designer.

Aspirations for future practice-led research

As well as testing the implications of more objective methods and designerly positions, I intend to iterate both the recommendations and the roles in respect of the additional negative modes of engagement that emerged in the case studies. A practice-led investigation resulting in strategic guidelines for overcoming disengagement would complement my findings. Moving beyond exploration and participation, there is scope to devise additional methodological stages and collaboratively develop proposed interventions through piloting. Postdoctoral research in this area would enable my wider engagement with interdisciplinary stakeholders and collaborators. I see the five-stage participatory-reflexive methodology as having broader applications beyond environmental, community, and organisational placemaking, and anticipate an empathic role for visualisation and storytelling in emotional wellbeing contexts. I aim to develop the autoethnographic drawing and reflexive analysis tools and techniques to visually disseminate multiple interpretations of the human-

centred design process. This seeks to negotiate a socially inclusive process and a rich intersubjective knowledge to inform and inspire innovative solutions for implementation.

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