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9. Co-design, organisational creativity and quality improvement in the healthcare sector: ‘designerly’ or ‘design-like’?

Glenn Robert & Alastair S. Macdonald

9.1 Introduction
Co-creation, co-production, co-design: the last decade has seen a growing recognition of the importance of a more collective contribution from those who are both delivering and receiving any form of public service. Within the healthcare sector increasing adoption of co-design as a means of improving service quality is confronted by a predominantly positivist paradigm which relies upon objective (independent) scientific methods of inquiry, such as experiments and statistics. This has created tensions and a challenge for progressive Design approaches.

We highlight how - within this particular context - two forms of ‘designing’ have successfully created new conversation spaces between patients, carers and healthcare staff. The first we characterise as ‘designerly’ in that it sits squarely within the Service Design field: it is led by designers and is firmly rooted in participatory design and iterative prototyping. The second we term ‘design-like’ as - although drawing on design-based tools, techniques and ways of thinking - it is led by non-designers and framed as using a Participatory Action Research (PAR) approach as part of a quality improvement intervention. PAR sets out - in contrast to a positivist paradigm - to recognise and directly address complex human and social problems. Whilst much of the early action research in healthcare was criticized for poor design and lack of rigor, and it was often neither educative nor empowering for those involved, proponents of PAR have since argued that the sacrifice of some methodological and technical rigor is worth the additional face validity and practical significance that is gained (McIntyre 2008, Robert 2013).
Whilst enabled through different mechanisms - design probes and prototypes, and ‘trigger’ films respectively – both forms outlined above have led to the development, implementation and evaluation of complex interventions in the (often messy) world of healthcare delivery. [Throughout, we use the term ‘complex intervention’ to refer to an intervention that has several interacting components, involves social processes and is easy to adapt and tailor (Craig et al. 2008).]

Based on retrospective case studies - and from our respective backgrounds of design (AM) and organisational sociology (GR) - we explore the processes of designing, by both Designers (in the professional sense) and non-designers, within healthcare organisations and how ‘impact’ might best be evaluated. In doing so we raise the issue of how commensurable the aspirations and currently reported outcomes of Designers are with those of the positivist paradigm currently underpinning quality improvement (QI) work in healthcare organisations.

Our critical position is that improving the quality of healthcare services requires both ‘designerly’ and ‘design-like’ approaches working together in complementary ways. Drawing on the concept of ‘infrastructuring’ and the notion of ‘organisational creativity’ we outline the potential value of combining these approaches. But we argue that significant challenges remain - as evidenced in emerging descriptions of Designer-led interventions in healthcare organisations - in reconciling differences in cultures, methods, expectations, forms of ‘evaluation’, and constructions of ‘evidence’ and ‘knowledge’.

9.2 The healthcare sector
In terms of a service environment, several aspects of healthcare make it rather different from other sectors; not least its sheer scale, variety and complexity, as well as the (often) fragility, vulnerability and dependency of its clients. Healthcare organisations and services are also typically complex, hierarchical, and highly socio-technical settings
the dynamics within interdisciplinary healthcare teams are often as complex and hierarchical as those between teams and their patients. Healthcare organisations and the wider context in which they are situated therefore throw up many challenges and issues, firstly for the successful development and local implementation of any interventions and, secondly, for the evaluation of these. These challenges have important implications for Service Design.

9.2.1 Development and local implementation
The Medical Research Council framework (2000) for guiding development and evaluation of complex interventions was published in response to these realisations, and later updated (MRC 2008). The framework depicts an approach incorporating several iterative, non-linear phases (Craig et al. 2008) leading to the evaluation of an intervention through a definitive randomised controlled trial (RCT). As Murray et al (2010: 10) acknowledge, however, the complexities and 'multiple confounders' of the healthcare sector inevitably mean that approaches to prospective solutions developed by a single discipline may be less successful than those embodying the collective experiences, insights and expertise of all involved. The development of such complex interventions - pragmatic enough to be applied in real-life settings - therefore remains challenging (Paul et al 2007). Criticism has been levelled at health services researchers for conducting insufficient groundwork and spending inadequate time and resources on intervention development, with the result that many interventions are either never (or poorly) implemented or fail to achieve their original intentions (Craig et al 2008).

Despite agreement in the research and clinical communities regarding the need for careful planning and design of complex interventions (Rowlands et al 2005), there is no consensus on optimal methods for developing, evaluating and implementing them and considerable variation in the practical application of the MRC framework (Murchie et al 2007, Tilling et al 2005, Robinson et al 2005). Notably, the MRC framework places no emphasis on the intervention's interaction with context - the setting in which it is to be
delivered (Bonell et al 2012, De Silva et al 2014). The MRC (2008) does emphasise involvement of ‘users’ at all stages of intervention development and evaluation in order to deliver an intervention that is fit for purpose, thereby enhancing the likelihood of it being implemented in practice. They advocate use of qualitative research methods to involve users and gain insight into change processes.

9.2.2 Quality Improvement (QI) in healthcare

Broadly defined as “better patient experience and outcomes achieved through changing service provider behaviour and organisation through using a systematic change method and strategies” (Ovretveit 2009: 8), QI lies at one intersection between Service Design and healthcare organisations. Although QI ‘work’ draws on a wide variety of methodologies, approaches and tools it has historically been dominated by a positivist paradigm; witness the plethora of scientific and technology-based solutions as well as guidelines, scorecards, metrics and measurement systems. And fitting within the positivist paradigm, and following the tenets of Evidence Based Medicine (EBM), the RCT - with its robust scientific approach - is traditionally viewed as the gold standard of ‘evidence’ against which to assess the relative effectiveness of these QI tools and the new innovations in service delivery that result from their application.

The healthcare context also has significant implications for the evaluation of the impact of any design-led ‘solutions’, for - as Lewin et al (2009: 1) note – “complex healthcare interventions involve social processes that can be difficult to explore using quantitative methods alone”. Therefore, despite the supposed pre-eminence of the RCT, findings from such studies often do not sit comfortably with the complexities of daily life, particularly where ‘proven’ innovations must become part of the routine practice of multiple teams comprising individuals with very different disciplinary backgrounds and hierarchical status.
9.3 The Service Design perspective
We believe that solving the implementation and evaluation challenges briefly outlined above may be significantly shaped by attending to issues currently (largely) neglected by the world of Evidence Based Medicine (Greenhalgh et al. 2014): issues such as culture, language and cognition, identity and citizenship. Such considerations are often embedded in the best of Service Design which builds on “the generation of a deep and holistic understanding of the service user experience, uncovering the ‘touchpoints’ or points of emotional connection (both delight and despair) with a service” (Snook 2015), as well as placing “a stronger emphasis [on] individual and community empowerment, creating the conditions and increasing the opportunities for people to work with public service providers to participate in the definition of community solutions, enabling a real shift of power” (Marmot 2010, cited in Snook, 2015).

If we accept that the knowledge of both specialists and lay individuals is useful, valuable, vital even, then how do we create a forum for exploring alternative, ‘improved’, healthcare services? Here the term ‘public’ as defined by Le Dantec and DiSalvo is useful: “In our use of the word ‘public’, we embrace the contention, unevenness, and permeability of a public by recognizing that a public is usefully understood as a plurality of voices, opinions, and positions” (2013: 243). Where is the space for this collective, open discourse where the prevailing hierarchies and predominant modes of thinking can be challenged and suspended, where differing views of ‘evidence’ and ‘knowledge’ are not mutually exclusive, and where there is the opportunity to allow simultaneous inherent contradictions (as distinct from consensus)?

9.3.1 Publics and infrastructuring
Such a public – or open space - needs to be inhabited by the essential actors so that they can then work collaboratively. In this forum, the intention is to use Design: “a set of practices aimed at realising a certain desirable future” (Storni 2013: 51). However, in the healthcare arena, the Designer has neither expertise in the clinical or care sense, nor
is s/he a ‘virtuoso of experience’. These fora and activities also therefore require what Björgvinsson et al (2010) refer to as ‘infrastructuring’, i.e. “to capture particular views and ways of engaging when designing complex sustainable systems” (Seravalli and Eriksen, in press) designing situations, activities and materials to enable a “greater proportional symmetry” (Strickfaden and Devlieger 2011: 208) between key players, and “reducing social distance” (Greger and Hatami 2013) between the varied cultures, languages, and motivations of the different stakeholders. In doing so such activities seek to level traditional hierarchies and neutralise assumed authority, with the twin aims of better empowering all stakeholders and improving decision-making.

Within this open space, the assembled team are “individuals bound by a common cause” (Le Dantec and DiSalvo 2013: 243), “a dynamic organization of individuals and groups formed by the desire to address an issue” (ibid: 254) “moving away from a technocratic view of innovation towards one that includes social innovation – innovation that arises out of social interactions [...] and actions that arise from the constitutions of a public” (ibid: 247). This space and the use of infrastructure materials within it allow the participants to explore the ‘lived experiences’, to allow the ‘plurality of voices, opinions and positions’ to emerge and which can then be reconciled through a PAR process.

9.4 Healthcare Quality Improvement & Design-based approaches

It is in addressing the common implementation and evaluation ‘gaps’ described above that a combination of design-based and social science perspectives can make a significant contribution.

On the one hand, user-centred (or participatory) design offers methods, tools and techniques which were little used in health care QI work until very recently (Robert 2013). More broadly, design thinking (Cross 2011) offers a new lens, or frame of mind, through which to conceive approaches to improving the quality of healthcare; primarily
its pragmatic nature highlighting the importance of ‘making sense’ of experience and finding solutions to poorly designed interactions.

Similarly, PAR sets out - in contrast to the traditional, positivist, science paradigm - to recognise and directly address complex human and social problems. Although encompassing a wide range of research practices, McIntyre (2008: 1) proposes four underlying tenets to the majority of PAR projects: (a) a collective commitment to investigate an issue or problem, (b) a desire to engage in self- and collective reflection to gain clarity about the issue under investigation, (c) a joint desire to engage in individual and/or collective action that leads to a useful solution that benefits the people involved, and (d) the building of alliances between researchers and participants in the planning, implementation and dissemination of the research process.

In doing so, PAR can be viewed as ‘design-like’ - enabling in-depth understanding of the meanings and meaning-making practices of individuals and social groups (Donetto et al 2015) - as well as bringing theoretical insight to change interventions aimed at addressing very practical concerns (Bate and Robert 2008). Below we describe two recent case studies that have sought to overcome the all-too-common shortcomings relating to the development, implementation and evaluation of new innovations in healthcare service delivery. Both working explicitly within the MRC Complex Interventions framework they have used either a ‘designerly’ or ‘design-like’ approach, thereby “combining people-based and evidence-based research into complex social settings characterised by uncertainty and the unknown” (Chevalier and Buckles 2013).

9.4.1 Case study 1
Elsewhere we have described the origins and evolution of the Experience-based Co-design (EBCD) methodology (Robert 2013, Robert et al. 2015), an action research process that takes a user-centred orientation (by adopting a narrative story-telling approach) and centres around a participatory, collaborative co-design process. EBCD has been conceptualised as a ‘grand project’, in contrast to the bespoke nature of most
Design interventions (Macdonald, forthcoming). Box 1 describes one example of implementing this Service Design informed approach in a healthcare setting.

Box 1 Designing and evaluating a Quality Improvement intervention using EBCD without designers (based on Tsianakas et al 2015)

Case study 1 describes a feasibility trial, which used EBCD to develop an intervention to support carers of outpatient cancer patients receiving chemotherapy. The trial followed the MRC's Framework for Developing and Evaluating Complex Interventions (phases I-IV) and, importantly, as well as the content of the intervention itself this included the co-design with staff of the process by which the intervention was best delivered to carers. The project was led by non-designers (supported by an online toolkit).

In Phase I (pre-clinical phase) the EBCD process commenced with two weeks of non-participant observation (including of chemotherapy administration, doctor-led consultations consenting for chemotherapy and nurse-led pre-chemotherapy consultations). Interviews with carers and professionals were then undertaken; carers discussed their experiences of supporting a friend or relative through chemotherapy (following the EBCD process, these interviews were filmed digitally) and staff were asked about their perceptions of the carer’s role and the support currently offered to them. In Phase II (modelling phase) three separate facilitated workshops were held with (1) staff (2) carers, and (3) carers and staff together. These workshops enabled participants to review themes arising from analysis of their own Phase I data independently and then work together in the combined workshop to co-design an intervention for carers supporting friends or relatives through chemotherapy. The carer workshop began with playing an edited 20-minute film compiled from the touchpoints identified from the carers' filmed interviews. At the final workshop carers and staff came to a shared agreement about the ideal components and delivery of the new support package ('Take Care') which comprised a 19-minute supportive/educative DVD, an accompanying booklet and 1-h protocol-guided group consultation conducted by one of two chemotherapy nurses trained in group facilitation. In Phase III (Exploratory trial) forty-seven carers were recruited, randomised between 'Take Care'
(n=24) and control (n=23) groups. A questionnaire was completed pre- and post-intervention measuring knowledge of chemotherapy and its side effects, experience of care, satisfaction with outpatient services, coping and emotional wellbeing. Carers in receipt of the 'Take Care' intervention reported statistically significantly better understanding of symptoms and side effects and their information needs being more frequently met than carers in the control. Confidence in coping improved between baseline and follow-up for the intervention group and declined for the control. Staff and carer focus groups confirmed the feasibility and acceptability of the intervention. Study findings supported the conduct of a fully powered RCT to determine the intervention’s effectiveness and cost-effectiveness (Phase IV: Evaluation).

Given that EBCD, in this type of space, has already demonstrated an arguably successful form of designing without Designers (Macdonald, forthcoming), an important question is to define the particular roles and contributions of the Designer, and of Design.

9.4.2 Case study 2
With this question in mind, our second case study (whilst also demonstrating the process and benefits of integrating a mixed methods approach into the MRC’s Framework), describes a feasibility RCT where the development of the intervention was Designer-led but where therapists and stroke survivors played a significant role (see Box 2).

Box 2  A Designer-led visual intervention for physical rehabilitation following stroke
Case study 2 concerns the development of visual tools, exploiting motion capture and motion sensor technologies, for use in physical rehabilitation following stroke (Macdonald et al 2014). These were evaluated in three separate RCTs as follows: 1) for upper limb rehabilitation (Jones et al 2014), 2) lower limb rehabilitation (Thikey et al 2014), and 3) for the tuning of ankle foot orthoses (Carse et al 2014). In their design, both the patients’ and therapists’ needs and agendas had to be articulated and embodied along with clinical biomechanists’. Their design and
development was achieved through an iterative participative process throughout the four phases of the trial, employing mock-ups and prototypes of digital mannequins displaying motion capture and other essential data. In the 4 phases of this trial, qualitative methods used were briefly as follows: 1. Design: focus groups and testing and feedback sessions (stroke survivors and therapists not involved in the subsequent trial); 2. Pre-trials: patient interviews, health professional interviews (patients and their therapists). 3. Trials: observations, videos (patients and their therapists); and 4. Post-trials: patient interviews, health professional interviews, workshops with patients and health professionals (patients and their therapists). In terms of evaluation, an interpretive descriptive methodology was adopted, using a mix of semi-structured interviews and focus group discussions at key phases during the trial process. The data were analysed iteratively using Framework Analysis. As reported in Loudon et al (2014: 385) “this process allowed researchers to gain an understanding of the end-users’ interpretations of and responses to the visualisations, to employ their many suggestions and ideas for improvement...” and that “early findings would suggest that the visual method allows for: improved patient understanding of their rehabilitation tasks and progress; and improved communication between patient and therapist previously perplexing challenges to successful rehabilitation” (ibid; 387). Findings (Macdonald et al 2013) indicate that these visual tools were able to mediate and enhance the social discourse between the therapist and the patient while simultaneously making appropriate biomechanical information available in formats understandable to each to benefit both patients and therapists.

Traditionally, in an RCT, the clinician would have determined and designed the intervention with the patients as ‘subjects’ and with therapists administering the intervention. In case 2, had Designers not become involved, a ‘public’ would not have been created, the positivist scientific orthodoxy would have prevailed, and predominantly quantitative data (i.e. the scientific measurement of step length, symmetry and speed) would have been collected, except for some ‘cursory’ qualitative data from pre- and post-trial interviews. To differentiate this case from the EBCD approach in case 1 above, the Designers’ iterative use of evolving visual prototypes to
constantly probe, with therapists and stroke survivors in the open space ‘what if?’ and tangibly demonstrate ‘how things could be’ led to a longer-than-usual design phase, but the qualitative responses elicited by the prototypes throughout the participative process were valuable in helping address issues raised at the start of this section (particularly identity, language, culture and cognition). Analysis of the qualitative data from the trial iteration of the prototype found how much this collectively created tool assisted communication and understanding between the therapist and patient.

9.5 Bridging the divide: infrastructuring to release organisational creativity and improve service quality
Having created a ‘publics’ as an exploratory and developmental space - whereas non-designers may be inclined to use methods more familiar to them (filmed interviews, focus groups, brainstorming and QI approaches such as Quality Circles or Plan-Do-Study-Act cycles) – the case studies above illustrate how Designers will typically employ a wider range of methods as ‘learning tools’ (Coughlan et al 2007: 124), and as ‘effective tools for organisational change’ (ibid: 132) (including, for example, stimulus cards, mappings, storyboards, scenarios, games, mock-ups and visualisations), using prototypes as means of ‘building to think’ (ibid: 128) and ‘giving permission to explore new behaviors [...] in a nonthreatening, low-risk way’ (ibid: 130),

Nonetheless, the extended type of engagement demonstrated in both case studies above recognises the iterative nature of stakeholder involvement, of the gradual refinement and emergence of an improvement or innovation. So, while previously in QI ‘work’ there may have been more of a top-down technocratic approach to the development of interventions, there is now the opportunity to bring a more socio-technical perspective to bear, albeit within the prevailing discourse of RCTs and ‘complex intervention’ frameworks. Whilst the two approaches to ‘designing’ improvements in healthcare quality have - as briefly illustrated above - similarities, each
has strengths and weaknesses that differentiate it from the other; these are summarised in figure 9.1 below.

[insert figure 9.1 here]

Referring to our previous discussion on ‘infrastructuring’ - which as a reminder we broadly define as the design of the situations and materials (socio-technical) to enable new forms of discussions and, activities (including designing) to occur to achieve certain aims - the two case studies above illustrate two different approaches to this. In the first case trigger films were used, in the second prototyping, to support respective infrastructuring arrangements. Importantly, as Björgvinsson et al. (2010: 43) note, “Infrastructuring can be seen as an ongoing process and should not be seen as being delimited to a design project phase.” In our created ‘publics’, each with its particular kinds of tools and approaches, one can suppose the encouragement of the mutual crafting of narratives, prototypes and other socio-technical materials, all within the widely recognised and accepted MRC Framework. However, the different forms of infrastructuring, which we observed in our case studies - whilst both building and sustaining the ‘publics’ - appear to us to have released rather different forms of organisational creativity.

9.6 Organisational creativity
Operating as we do at the confluence of Design and QI ‘work’ in healthcare organisations we are struck by Woodman’s notion of organisational creativity, which (writing from an organisational theory perspective) he defines as “the creation of valuable new products, services, ideas, processes, or procedures by individuals working together within complex systems” (2014: 10). Woodman emphasises “the importance of building creative capacity into the system” (2014: 12) which relates to our earlier argument
regarding the ‘publics’ and how infrastructuring might help provide a space where organisational creativity might be encouraged and released to drive quality improvements (figure 9.1). In case study 1 above, the nature of the quality improvements related to improved understanding and confidence amongst participants (in this case carers of chemotherapy patients) whilst case study 2 saw the creation of an interactive rehabilitation environment through new visual tools whereby - for example - both patient and therapist were able to better communicate and discuss key issues and progress with rehabilitation tasks.

Certainly Woodman’s conceptualisation of organisational diagnosis - 'things could be better' - chimes neatly with the 'what if...?' kind of design activities that take people out of their normal hierarchies and task-roles and use their insights and expertise to re-imagine the service. The use of 'democratic' methods inherent in PAR also challenges the 'top management... proprietary' issues (Woodman 2014: 8) and assist in breaking down the 'barriers to creativity' (ibid: 10). If Design is “a set of practices aimed at realising a certain desirable future” (Storni 2013: 51) then it might also be regarded as the 'quasi-experimental design,' which Woodman discusses (2014: 7).

Design Strategist Penny Hagen suggests that much is to be gained from effective integration of evidence-based and user experience-based approaches to design for healthcare services (Hagen 2014). Although this integration requires ‘some collaboration and open thinking’ to bridge the different philosophical stances of the two approaches, we agree - as evidenced by the incorporation of our own work into the MRC Framework - that there is great value in integrating “the human-centred tools and values of user experience design into existing processes and models that already have leverage within organisations” (ibid).

9.7 Designerly or design-like?
Referring to figure 9.1, designerly (Designer), and design-like (non-designer) behaviours are distinguished: both have their strengths and weaknesses in the context
of healthcare QI work. In looking at these two approaches is there a profitable central ground? Case 1 involved design-like approaches. Thomson et al (2015) critique EBCD suggesting a need for much more focus on ideation tools, a supposition which they test through a Designer-led intervention in an outpatient service for multiple sclerosis patients. However, we would note that this study provided no insight or ‘evidence’ that the Designer-led use of ideation tools lead to an improvement in quality over and above what, for arguments sake, EBCD would have done, suggesting that being ‘designerly’ alone offers no particular advantage, possibly less. We also note that Bowen et al (2013) were a little underwhelmed by the outcomes and changes brought about in the project they led as Designers - which focused on the medical outpatient service for older people - suggesting the need for an expanded vocabulary of creative methods in EBCD. Case 2 involved designerly approaches and although the evaluation of this process was arguably robust, the scalability and adaptability of the methods remains unproven.

9.8. Conclusions
We propose that the creation of a ‘publics’ which provides a democratising space can now be supported by infrastructuring using a wider range of engagement activities from the social sciences and design as illustrated in our two case studies above, either of which can complement (and perhaps subtly challenge) the positivist orthodoxy (as represented by the MRC Framework). Such a combination may help Designers and QI practitioners in healthcare organisations continuing to avoid ‘talking past one another’ and enable both to benefit from the other’s constructions of knowledge and ‘evidence’.

However, if Designers wish to achieve wider legitimacy for their approaches and for their design solutions to be assimilated into routine healthcare practice what should they do? We argue that they need to learn how to better relate not only to different evaluation approaches and forms of knowledge but also to the complex social systems in which they find themselves operating. As argued elsewhere (Donetto et al 2015) -
robust evaluations of Design-led approaches to healthcare improvement are clearly needed and these should be accompanied by rigorous conceptual analyses of their theoretical and methodological bases (by both Designers and non-designers alike).

References


**Figure 9.1**

<table>
<thead>
<tr>
<th>Designing</th>
<th>open, democratic, user-experience based, mixed methods</th>
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| Non-designers | e.g. Experience-based Co-Design  
*design-like* |
| Designers | e.g. Service Design  
*designerly* |
| **Publics / infrastructuring** | |
| trigger films, emotional mapping  
touchpoints | stimulus cards, mappings, storyboards, scenarios,  
games, mock-ups, visualisations, rapid prototypes |
| **Organisational creativity** | |
| *things could be better* | *what if ... ?* |
| quasi-experimental approaches | speculative approaches |
| **Quality improvements in healthcare organisations** | |
| **weaknesses** | **strengths** | **weaknesses** |
| limited range of outcomes?  
incremental, less radical?  
too long, too complicated  
limited ideation tools  
needs more robust evaluation | seen as cost effective  
adaptability  
critical mass (part of QI)  
well-reported evidence  
scalability  
shifts power relationships | anecdotal  
lack of robustness: poor reporting and evaluation  
little shared learning: between bespoke projects |
| iterative  
build-to-think  
makes ideas tangible early  
permits new behaviours  
experience prototypes  
more transformative | | lack of scalability |