Chapter 14
Networked Professional Learning, Design Research and Social Innovation

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Abstract This chapter uses a reading of the preceding chapters in the book to develop an argument about the benefits of acknowledging and strengthening some deep synergies within the field of networked professional learning. In particular, it identifies some lines of convergence between professional action, professional learning and the practices of research and design in networked learning. The chapter's unifying constructs include service design, social innovation and (participatory) design research. While it is important to recognise that there can be important differences between the situations of professional action, learning and teaching and research and design, there are also substantial benefits to be obtained from working with their similarities. The chapter locates professional work in the broader context of the search for more sustainable ways of life. It introduces ideas about social innovation, collaborative forms of service design and participatory design research to prepare the ground for a reinterpretation of some common elements of professional work and networked professional learning.

Introduction

In combination, the chapters in this book represent a significant advance in our understanding of the field of networked learning. They investigate three important sites of networked learning practice, using a number of complementary approaches to produce knowledge that can inform our thinking about, and preparation for, future educational design work. Chapters in the first section help render more salient and visible the activities of those participating in learning networks. Designs for networked learning usually assume pro-active, self-managing learners: but we rarely know enough about how they do what they do. Chapters in the second section illuminate ways in which professional work involves collaborative inquiry. They provide ideas for educational designs that can help people sharpen

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their inquiry skills and adopt a more expansive framing of professional learning, action and innovation. They help us discern some deeper resemblances between inquiry in professional, community and academic settings. At first glance, chapters in the third section seem to be narrower and more inward-looking. But actually they touch upon some profound issues about social learning, value and reciprocity, and they help distinguish between incrementally adaptive and more transformational experiences of learning. They provide designers with ideas and language that can help resolve questions of agency and structure, self-organisation and external support. These are just highlights: there is much more to be found in each section.

This book is part of a growing body of work that has emerged from early research and practitioner-led innovation, focused on computer-mediated communications and collaborative learning in communities and/or networks, dating back to the late 1980s (Carvalho & Goodyear, 2014; Dohn, 2018; Hodgson, McConnell, & Dirckinck-Holmfeld, 2011; Jandric & Boras, 2015; Jones, 2015). Within this networked learning tradition, there has been a strong interest in critical and emancipatory approaches to supporting adult and professional learning. These characteristics mark it out from the mainstreams of research and development activity in computer-supported collaborative learning (CSCL), where attention has been much more focussed on small-group learning by school-aged children, and, to a lesser extent, by university students (Goodyear, Jones, & Thompson, 2013). The critical and emancipatory stance that permeates networked learning aligns it more closely with the 'Connected Learning' movement (e.g. Ito et al., 2013), though one might argue that Connected Learning is still driven strongly, and constrained, by its valorisation of conventional school outcome measures. It is regrettable that networked learning is still *terra incognita* to many CSCL researchers, particularly those based in the USA (see, e.g. Kafai & Peppler, 2011). I say this for three main reasons: (i) the networked learning community has been very open and energetic in exploring new theoretical ideas, particularly in the area of socio-material theory, (ii) it has avoided being locked into K-12 education and its engrained practices, values and constraints – enabling it to explore lifelong and lifewide learning (see Pettersson & Olafsson, this volume) and (iii) there is an urgent need for empowering approaches to technology-supported collective learning and action that can help people invent more sustainable ways of life. So part of my motivation in writing this final chapter is to draw together some threads that run through the chapters of the book – ideas evolving among networked learning innovators and researchers – and weave a few additional connections among the concerns of professional action, collaborative learning and inquiry and designing for sustainable living. In so doing, I draw on two related sets of ideas about design, hoping to show how design can be understood as the 'first tradition' in human development – with modes of linking thought and action that give it powers neither science nor art possess (Nelson & Stolterman, 2014) and looking at what expert design can contribute in a world where 'everyone designs' (Manzini, 2015).

Professional Services

Professional work is characterised by the provision of a service to a client for a fee. The right to practice normally depends upon demonstration of appropriate high-level expertise and is regulated by a supervisory professional body, which sets standards. In the last 50 years or so, there has been a softening of the boundaries around professional work, with the formation of so-called 'softer' or 'quasi' professions such as nursing and teaching. There has also been a restructuring of client and fee arrangements, with increasing numbers of professionals working in and for larger organisations, both private and public. Alongside this, the shift in emphasis from primary production and manufacturing to services, in the world's richer economies, means that many areas of knowledge-intensive work are concerned with service provision rather than the production and sale of material objects. Much of what is said in this book about professional work, professionals and their learning also holds true for a broader array of knowledge work and knowledge workers, including those who provide services through the 'gig' economy. For brevity, I will use 'professional' as an umbrella term to cover them too.

Services are often *co-constructed* or *co-produced*: it is not uncommon for effective service provision to depend upon the contribution of a pro-active client. For example, a patient has to take their medicine and they usually have to play an active role in helping their doctor diagnose their condition. A lawyer defending someone accused of a crime depends upon their client for a version of the events that led to their arrest. A student, being taught, has to play an active role in constructing their own knowledge, or they will not learn much.

Professional service provision can sometimes be a routine activity. Problems often present themselves in familiar ways, and established procedures exist for dealing with them. This is especially the case with 'tame' or 'well-structured' problems, where the main challenge for the professional person is to identify the kind of problem the client has brought. The course of action that then needs to be taken flows directly from this diagnostic work. Sometimes, further investigation is needed to fill in missing information, before a decision can be made about what to do next. But this kind of inquiry process is also well-understood by, and very familiar to, an experienced professional in the field concerned (see Table 14.1).

However, professional workers are sometimes confronted with problematic situations in which tried-and-tested routines fail. This may be to do with the novelty of the problem presented, but as Rittel and Webber (1973) argued, some kinds of problems are intrinsically harder to deal with. Their characteristics and structure make them 'wicked' or even 'super-wicked' problems (Levin et al., 2012). These are not just more complex versions of 'tame' problems. They are qualitatively different (Table 14.1).

Among other things, progress on wicked and super-wicked problems depends on active involvement of stakeholders: people who have 'skin in the game'. In such situations, professional *must* work closely with client/stakeholders to co-design and co-create solutions: ways and means for moving forward. It turns out that a good

Table 14.1 Tame, wicked and super-wicked problems. (Compiled from Rittel & Webber, 1973; Nelson & Stolterman, 2014; Goodyear & Markauskaite, 2019; Levin, Cashore, Bernstein, & Auld, 2012)

Solving tame problems	
1. Identify the problem type	
2. Gather more information if necessary	
3. Propose a solution	
4. Test the solution	
5. Modify solution if necessary	
Wicked problems	
Characteristic	*Explanation*
No definitive formulation	With 'tame' problems, the problem solver can be given in advance all the information needed to solve the problem. With wicked problems, the information needed depends on candidate solutions. In other words, 'the formulation of a wicked problem *is* the problem' (Rittel & Webber, 1973, p. 161)
No 'stopping rule'	No criteria inherent in the problem show unequivocally that it has been solved; work on wicked problems typically stops because of external constraints – Such as time or money
No 'true-false' solutions	There are no formal decision rules that can be applied objectively to say that a solution is appropriate; different people/groups will have different views on a solution, but none will be able to finally determine its correctness
No satisfactory tests of solutions	Any solution will generate waves of consequences; evaluation of these consequences will often cause people to reconsider what they previously saw as a satisfactory solution
Every attempt at a solution has consequences	Every solution (or partial solution) has consequences – It changes the nature of the problem
Inexhaustible solutions	Any new idea may become a candidate solution, or part of the solution; one cannot enumerate all possible solutions or solution steps in advance
Super-wicked problems	
Characteristic	*Explanation* (examples relate to action on climate change)
Time is running out	While political expediency can sometimes allow action on social policy issues to be delayed, natural/environmental systems run to their own timeframes and impose their own penalties for delayed action
Those who cause the problem also seek to provide a solution	Everyone who seeks to reduce emissions also causes emissions
The central authority needed to address it is weak or non-existent	There are no governance or co-ordination mechanisms capable of working across regions, economic sectors, policy subsystems and scale levels
And partly as a result (of all three characteristics), policy responses discount the future irrationally	Current/short-term advantages are given undue weight relative to long-term disadvantages (e.g. cheap energy now is valued over long-term climate change)

deal of professional work actually involves the co-production of services, but wicked problems *necessarily* involve co-production. Collaborative activity of this kind involves joint inquiry leading to joint action and also joint design of the means of inquiry (Markauskaite & Goodyear, 2017).

Professional Work, Change and Sustainability

In thinking about the future of professional work and networked professional learning, it makes sense to acknowledge some broader issues playing out in the world. The problems associated with climate change and adaptation, globalisation, inequality, mass movements of people and capital, pollution, food and water security, discrimination and chauvinism manifest themselves in a variety of ways. Their repercussions permeate many areas of professional work.

At a minimum, they affect the circumstances in which professional work is conducted and in which professionals continue to learn and develop. For example, changes in the nature and intensity of the problems that clients bring to consultations with professionals mean that the 'bridges' connecting initial professional education to ongoing professional practice and continuing professional development will become very long and attenuated (Dalsgaard, Chaudhari & Littlejohn, this volume; Hansen & Dohn, this volume). The focus of ongoing professional learning will continue to shift from routine updating of skills and knowledge to participation in the design of new, more 'agile and flexible', forms of practice, including the development of new areas of inter-professional practice and the relational expertise on which it depends (Edwards, 2010; Markauskaite & Goodyear, 2017; Konnerup et al., this volume; Jaldemark et al., this volume).

Quite likely, many professional workers will also find themselves deeply involved in the extensive processes of change needed to find a sustainable future for human life and to navigate paths through the super-wicked problems that neo-liberalism and market-driven ideologies have accumulated. Enzio Manzini refers to this as 'the great transition':

> … a process of change in which humanity is beginning to come to terms with the limits of the planet, and which is also leading us to make better use of the connectivity that is available to us: a dual dynamics merging into a single process …. (Manzini, 2015, 2)

Ideas from design theorists like Manzini can help us think about how we may shape the scope, scale and purposes of our networked learning practices to better align with the circumstances of this 'great transition'. In so doing, we also need to bear in mind that the old order – based on assumptions of limitless resources – will persist for some time alongside the emerging new order and that professional workers and their learning networks will be disrupted and sometimes strained to breaking by these turbulent forces.

Social Innovation and Collaborative Service Design

> Design for social innovation is everything that expert design can do to activate, sustain, and orient processes of social change toward sustainability. (Manzini, 2015, 62)

By definition, intractable social problems – wicked and super-wicked problems – cannot be resolved by top-down government action or by markets. There is growing evidence that more radical solutions are needed: solutions which reframe the problems as posed and reconfigure the relationships and processes involved, often in ways which link local action by those most affected by the problem with more global networks that help analyse and contextualise issues and strategies. This necessarily entails distributed systems:

> … sociotechnical systems that are scattered in many different but connected, relatively autonomous parts, which are mutually linked within wider networks. (Manzini, 2015, 17)

Instead of relying on centralised and/or marketized systems to meet human needs, a shift is underway to more distributed arrangements, where smaller systems can be customised by local people to local needs, without losing the capacity to shift information and other resources around across wider networks ('cosmopolitan localism'). Distributed systems are more amenable to diversity, redundancy and learning – through local experimentation and the sharing of outcomes. In other words, they are inherently more *resilient* than large centralised uniform systems.

Like many others, Manzini sees *social innovation* as essential to navigating the 'great transition'. Social innovations are new ideas, products, services, models, frameworks, etc. that simultaneously meet social needs and create new social relationships. Social innovation involves people in 'creating solutions outside the mainstream patterns of production and consumption' (Cipolla & Manzini, 2009, 45). In other work, Manzini and colleagues also speak of collaborative and relational services. Collaborative services are:

> services that people jointly produce to fulfil their unmet needs by using peer-to-peer and collaborative relationships. When the social form created by these people is bound by a sense of community, it is called a collaborative community. Some collaborative services that address social issues and produce relational goods such as trust, attention, and care are social innovations: they contribute to sustainability and resilience of society because they are known to reinforce social cohesion, thereby creating a positive impact on society. (Baek, Kim, Pahk, & Manzini, 2018, 54).

Relational services are thoroughly entangled with interpersonal relations and are 'based on an approach where benefits are reciprocally produced and shared by the participants' (Cipolla & Manzini, 2009, 47–8). As with design for learning, relational services can only be 'enabled'. In other words, they need to be designed 'in such a way as to start up, support, and continuously sustain interpersonal encounters between the participants' (op cit, 50).

Drawing on the *capability approach* of Martha Nussbaum and Amartya Sen (e.g. Nussbaum, 2000; Nussbaum & Sen, 1993; Sen, 1999), Manzini repositions design as follows:

> In this way of seeing things, the role of design experts is no longer that of developing finished products and services. Instead, their task is to design to expand the capabilities of people to lead the kinds of lives they value. This means that, rather than trying to identify needs and design solutions to satisfy them, design experts should collaborate in creating favorable conditions for those directly concerned to come up with and put into practice ways of living and acting to which they themselves, the protagonists, attribute value. … while design experts, while intervening in the design of the enabling solution, do not determine the way in which people will decide to operate, they do create *action platforms* and *sense systems* thanks to which different behaviour may be more or less viable and more or less culturally commendable, and therefore more or less probable. (Manzini, 2015, 98, emphasis added)

This dual emphasis on action and inquiry (sense-making) is a key theme in conceptualising design-based approaches to change. In their highly influential book on *The Design Way*, Nelson and Stolterman (2014) argue that design activity should be recognised as the 'first tradition' in human development: a tradition that has been eclipsed by both creative art and science. Indeed, the power of design as a way of integrating thought and action is, they contend, obscured by the divisions in Western thought that split science from craft and from the humanities.

> Human intention, made visible and concrete through the instrumentality of design, enables us to create conditions, systems, and artifacts that facilitate the unfolding of human potential through designed evolution in contrast to an evolution based on chance and necessity (Nelson & Stolterman, 2014, 2).

A distinctive feature of design inquiry is that it combines a search for what is true, what is real and what is ideal. In other words, it is a compound of (i) the more abstract forms of principled or law-like knowledge that we associate with science, (ii) concrete particulars of the here and now that afford and constrain certain kinds of action, and (iii) values and desired goals – which are not always self-evident. Design inquiry is closely coupled with design action: making change in the world, through processes of composing and connecting, creating a unified whole.

> Design is about evoking, or creating, the ideal in the real. But design has to be grounded in what is already real, as well as what is actually true. Since the real is overwhelmingly complex and rich, we are unable to grasp the totality of that complexity and richness solely by using the systems of inquiry created to reveal what is true and factual (op. cit., 39–40).

In my view, some of the recent spates of writing in education about design thinking underplay the complexities of design inquiry and weaken the disciplining effects of the imperative to act in the world. (It 'domesticates' design thinking to make it manageable within the confines of the classroom.) This misrepresentation is significant. Kim Sterelny and others who study the evolution of human cognition make strong arguments for the importance of co-operation in the shaping of our species (e.g. Sterelny, 2003, 2012, 2014). Moreover, co-operative action creates opportunities for various forms of apprenticeship learning, mimetic learning or 'learning by observing and pitching in' (Billett, 2014; Rogoff, 2014). Networked learning also offers opportunities to participate in co-operative forms of inquiry and action, and indeed to learn to participate in such practices (Dohn, 2018; see also the earlier arguments of Ivan Illich (e.g. Illich, 1973) and Christopher Alexander (Alexander

et al., 1977) on the value of learning networks). So designing for (and in) learning networks has the potential to connect with and strengthen some deeply important modes of human development and push back against some of the dynamics of the current economic order. As Richard Sennett puts it: co-operation is a craft (that needs to be learned) and 'modern society is de-skilling people in practicing co-operation' (Sennett, 2012, 7). Before exploring this any further, I need to introduce some ideas about design research.

Design Research and Design Knowledge

In his presidential address to the American Educational Research Association in 1999, Alan Schoenfeld spoke about research in 'Pasteur's Quadrant'. The phrase and indeed the underpinning ideas were taken from Donald Stokes' reformulation of the relations between applied and fundamental research (Schoenfeld, 1999; Stokes, 1997). Stokes offered a critique of the prevailing *linear* conception of research and development: one that positions fundamental ('blue skies' or 'curiosity driven') research as both prior to and informing the kinds of applied research and implementation work that are needed to solve practical problems, or to create new treatments, products and services and bring them to market. On this view, *fundamental* research contrasts, and often competes, with *applied* research. For example, commercial pressures can be seen as a threat to research integrity and applied research can be seen as taking time away from fundamental research (which may also be seen as having higher academic status). Stokes, and Schoenfeld after him, reframed the relations between fundamental and applied research by folding a one-dimensional linear representation into a two-dimensional matrix (see Fig. 14.1). On *this* view, research can be both use-inspired and concerned with fundamental understanding. Schoenfeld argued that most educational research naturally sits in 'Pasteur's Quadrant'.

Considerations of use (practical application, etc)?

Quest for fundamental understanding (theoretical/ scientific advances, etc)?	NO	YES
YES	Pure basic research (Niels Bohr)	Use-inspired basic research (Louis Pasteur)
NO	'Bird spotting' (Gilbert White)	Pure applied research (Thomas Edison)

Fig. 14.1 Educational research in Pasteur's Quadrant. (After Schoenfeld, 1999; Goodyear, 2011). (Each cell in the table names an exemplary practitioner of the kind of research involved.)

If we think more specifically about research and its application in the narrower field of networked learning, two large questions spring immediately to mind. What counts as useful knowledge? What are we seeking a fundamental understanding of?

Starting with the first question, about useful knowledge, a line of response can be developed that identifies the main actors involved in networked learning, examines the nature of their activity – looking intently for critical moments when research-based knowledge might make a difference – and considers the kinds of knowledge that might be useful in such work. This is a *pragmatic* view of networked learning research, in the sense that it foregrounds the practical application of knowledge. It should not be confused with an instrumental view, in the sense of valuing *only* what can be used to achieve practical ends. A pragmatic view of networked learning research starts with the real-world activities and knowledge needs of people involved in networked learning. It aims to use a properly grounded understanding of their work practices, capabilities, goals and values, and the constraints within which they work, in order to guide the form and purpose of inquiry and dissemination. Following the logic of this pragmatic view of use-inspired research says nothing about the scope and purposes of curiosity-driven research. It certainly does not question the legitimacy of curiosity-driven research, or insist that the needs of one kind or class of research 'user' should be privileged. Rather, pragmatic use-inspired research avoids *guessing* what people need, and it works with them to find out.

For example, researchers can work with people who are very involved in *interactive teaching* – or online moderation – to get a clearer sense of the kinds of problems and opportunities that emerge in the course of such work, *and* to see how further research might help produce such things as richer pedagogical strategies or more worthwhile monitoring instruments (dashboards, etc.) In other words, it is research with a dual focus. It operates at two levels: identifying *and* meeting users' needs.

As another example, researchers can work with people who are involved in *upfront design* – planning and setting in place the various resources that can help stimulate and support a learning network. Research can focus on both identifying and meeting the needs of people engaged in such design activity. It is important to recognise that there are some substantial differences between the activities of online moderation and upfront design, especially if the former is virtually synchronous. Time pressure constrains the range of research-based guidance that can be consulted and considered in interactive teaching, whereas there is typically greater opportunity to analyse, think deeply, consult, reflect and reconsider during design work (Goodyear, 2015). A well-founded understanding of how educators are actually doing their work can and should inform the production of knowledge that is meant to be useful to them. Otherwise the path from research to application depends on wishful thinking about 'trickle down evidence'.

Manzini uses the term 'design knowledge' to mean 'knowledge that is useful to those who design' and 'design research' to mean research that is aimed at producing design knowledge (Manzini, 2015, 38). Taking the pragmatic view, design research ought not to proceed accidentally: it ought to be informed by a sense of how people who are engaged in design activities actually do what they do – extended, perhaps, with some imaginings of how they might engage in these activities more enjoyably,

efficiently or effectively if only they had some better tools and methods. Manzini's conception of design knowledge is an inclusive one. His central question is about what (expert, trained, professional) designers should be offering in a world where 'everyone designs'. What contribution can people with special expertise in design make to the more diffuse activities of 'amateur' or 'vernacular' designers, whether they be individuals, companies, communities or other kinds of organisation, involved in processes of design and co-design (Manzini, 2009, 5).

If we develop this inclusive conception further, the scope of design research expands considerably, and may start to feel all-inclusive and overwhelming. However, one can pick a way through the space of possibilities opened up. In a world where 'everyone designs', design research covers everything that anyone finds useful in their designerly activities. On the pragmatic (double focus) view, this means design research sets out to address (i) understanding the knowledge needs of vernacular designers and (ii) filling those needs. Moreover, since design involves both inquiry and action in the world, design research ought, in principle, to be able to meet the knowledge needs of those engaged in vernacular design inquiry. The space begins to look endlessly recursive. Except that what keeps recursion intellectually manageable is that it applies the same process (procedure or function) to different objects. In this case, design research can aim to identify and meet the needs of designers, whether they be expert designers or not: clients, professionals, students, teachers, networked learning practitioners, networked learning researchers, etc.

This also helps appreciate the various forms of knowledge that can be of value in design, including design for networked learning and collective action. For example, a deep misconception within educational policy and practice is that the most reliable knowledge takes the form of rigorously produced research-based evidence, laws and principles with wide spans of application. In Nelson and Stolterman's terms, this is *knowledge of what is true*. However, much of the knowledge produced and used within educational practice is *knowledge of what is real*. Understanding the concrete, complex realities of how an actual learning network functions is hard, neglected, undervalued but deeply important (Carvalho & Goodyear, 2014). Seen in this light, educational research has more to learn from ecology than from physics (Ellis & Goodyear, 2019; Hammer, Gouvea, & Watkins, 2018) and design research for networked professional learning can learn from more mainstream approaches to design inquiry. For example, Nelson and Stolterman (2014, 7–8) explain how design inquiry typically makes use of a variety of 'design schemas', such as the following:

- Organised patterns of thinking: models of design inquiry
- Ordered clusters of ideas for guiding design inquiry
- Strategies for gaining design knowledge, with the purpose of taking action
- Knowledge structures/cognitive representations of design thinking
- Cognitive frameworks representing means for managing design-oriented systemic inquiry
- Insights into how to give form to infinitely complex information and sense data
- Cognitive structures that organise subjective, objective and imaginative design-thinking processes

These help stock a toolkit for people involved in design for professional networked learning and design for learning more generally: whether in expert-led or grassroots forms.

Participatory Design Research

Participatory design research can be understood by reference to design research, design-based research and forms of community-based research such as action research and community-based design (Zavala, 2016). Its recent manifestations have grown out of design-based research (DBR) in the learning sciences community (see, e.g. Bang & Vossoughi, 2016). DBR has evolved a set of methods for trialling and incrementally improving an educational innovation. It has a strong commitment to working in everyday educational settings such as schools and universities – partly as a reaction to experiences in educational technology R&D in the 1970s and 1980s, where sophisticated systems that worked well in the lab failed to work in the 'real world' of education. Researchers taking a DBR approach therefore spend a good deal of time and energy trying to understand the additional supports, system tweaks, etc. that are needed to replicate and repeat success in complex educational settings. Although DBR is committed to making a difference in real-world settings, and is concerned to address issues of scaling-up and sustainability, it would be fair to say that it is strongly directed by the researchers' need to contribute to the advancement of theory. Indeed, a criticism of DBR is that it is more concerned with testing the theoretical ideas that inspired the innovation than with understanding the ecology into which the innovation was dropped (Ellis & Goodyear, 2019).

Participatory DBR is, in part, an attempt to shift the balance of power, and initiative, from university researchers (bringing *their* innovation to a classroom) to more carefully reflect the needs and positioning of the intended beneficiaries – those cast in the roles of students and teachers. Design research has at least two meanings: carrying out research by using design methods (researching by designing) and doing research to improve how design is done (researching for design). Most DBR in education is research by designing. In contrast, *participatory design research* is research carried out with the goal of creating design knowledge (knowledge useful to those who design), in ways that include all stakeholders in agentic roles. In Nelson & Stolterman's terms, it connotes design inquiry carried out by those people who are most intimately affected by an intended change, such as a significant social innovation. Such design inquiry *may* be strengthened by guidance from expert designers, but it is not driven by their professional needs and ambitions.

For example, Lucy Kimbell (2011) writes this way about service design as a form of constructivist enquiry:

> I describe designing for service as one specific way of approaching service design, combining an exploratory constructivist approach to design, proposing and creating new kinds of value relation within a socio-material configuration involving diverse actors including people, technologies and artifacts. This conceptualization has implications for other design fields, since it sees service as enacted in the relations between diverse actors, rather than as a specific kind of object to be designed. (Kimbell, 2011, 42)

Mapping Collaborative Encounters

Within the networked learning field, and in education more generally, ideas about 'community' have proven quite powerful, appearing in such terms as 'communities of practice', 'communities of inquiry' and 'learning communities' (Hod, Bielaczyc, & Ben-Zvi, 2018; Jones, 2015; Wenger, 1998; Wenger, Trayner, & de Laat, 2011). They are sometimes accompanied by notions of learning through apprenticeship or 'legitimate peripheral participation'. However, these ideas should not be used without some reflection on the more negative aspects of apprenticeship and community life. Traditionally, apprenticeship learning has sometimes been brutal and exploitative and communities have conservative, repressive and exclusionary powers, as well as their more convivial and congenial qualities. Manzini provides another way of thinking about this matter. He speaks of a growing trend towards 'collaboration by choice'.

> This intentional collaboration lies at the crossroads of two trajectories: one moving from the hyperindividualism of most industrialized societies toward a (re)discovery of the power of doing things together, and the other from traditional communities in less industrialized societies toward more flexible forms of intentional collaboration. (Manzini, 2015, 24)

Networked learning can be thought of in a similar way. Professional workers engaging in networked learning usually do so as a matter of choice and (in most NL arrangements) they retain a great deal of control over how and how much they participate.

As pointed out by Pettersson & Olafsson and van Amersfoort et al. (this volume), networked professional learning takes place in a variety of circumstances. Sometimes a learning network exists only because it is organised and supported by an educational organisation. In other cases, learning networks are self-managing and emergent: flourishing with 'runaway objects beyond formal settings and regulations'. The learning activity within networks may be formally structured or organised spontaneously or a mixture of both. Participants within a learning network may play little or no role in designing key aspects of how the network functions, or such decisions may be core to how the network governs itself. For instance, there may or may not be explicit processes for agreeing modes of inquiry or designing value creation cycles (Wenger et al., 2011; Vrieling-Teunter et al., this volume). The range of possibilities within networked professional learning practices means that the scope for useful design research is also very substantial. But some approaches to representing the functioning of a learning network, at one time or over time, have applicability whether or not the information they generate is used by the participants themselves (for self-managing activity) or by learning network convenors working on their behalf. Examples include the use of methods like Social Network Analysis and Content Analysis or through assessing aspects of value creation.

The example that I want to share here is from Manzini's work. It offers some language for talking about collaborative encounters. It can be applied to tracking the evolution of learning networks and provides some foundations for joint analysis and (re)design activities.

Table 14.2 Four dimensions for mapping collaborative encounters

Degree of active involvement	Users may take quite a passive role – partaking of a service provided by another person – or they may more actively co-produce the service, fielding personal resources as they do so (time, energy, attention, skills, expertise, etc.)
Degree of collaborative involvement	This may range from close to zero (doing almost everything alone or virtually alone) to intense (engaging closely with others)
Strength of social ties	May vary from weak to strong. Weak ties can be created quite quickly and may not persist; strong ties take time and commitment
Relational intensity	Characterises the affective and empathetic qualities of the encounter, the depth of the relationship, the degree to which people treat each other as fellow human beings rather than (say) seller and buyer

After Manzini (2015), 105–110

The approach uses four dimensions of collaborative encounters: active involvement, collaborative involvement, strength of social ties and relational intensity (see Table 14.2). Although many collaborative encounters, in learning networks and elsewhere, blur the distinctions between providers and users of a collaborative service, the account here retains these terms to help distinguish contributions when these are asymmetrical.

The first two dimensions (active and collaborative involvement) can be used to make a map of participant involvement (PI). The second two help us map interaction quality (IQ). The four dimensions can be simplified and represented in binary terms (e.g. active–passive or strong–weak), but it may be better to consider them as continuous variables. In either case, we can make two-dimensional maps of PI and QI, creating simple quadrants or more open zones. (Manzini does the former. Figures 14.2 and 14.3 do the latter.)

Figure 14.2 maps the space of *participant involvement*: who does what, with whom and how. A high degree of active involvement coupled with a low level of collaboration can be characterised as a DIY (do-it-yourself) arrangement. Self-drive car-sharing schemes are a typical example: high user input but little or no contact with other people. In the networked learning area, we could think of self-directed learning from online videos as an analogous case. Low levels of both active involvement and collaboration are typical of mainstream service delivery. Using a 'ride sharing' service like Uber or getting a quick answer to a question via an online chat-based 'helpdesk' are examples here. Higher levels of collaboration coupled with low levels of personal active involvement in the service itself are commonly found with co-managed services, as when a group of people work together on policies or high-level management issues but don't get involved in service delivery. A housing co-op which employs maintenance and cleaning staff is an example. Finally, Fig. 14.2 situates co-production as involving high levels of active involvement in production of the service itself, in collaboration with others. People who both organise and do voluntary work in a community garden are in this zone, as are people who collaborate within a self-managed learning network. It is important to point out that high levels of active or collaborative involvement are not in themselves virtu-

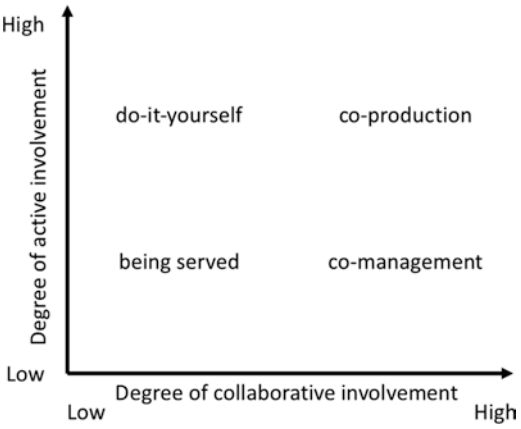

Fig. 14.2 Participant involvement (PI map). (After Manzini, 2015, 107)

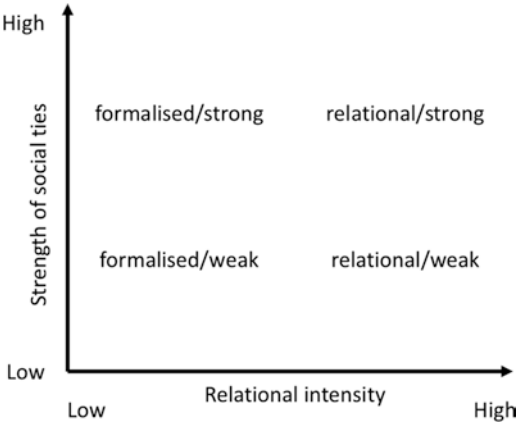

Fig. 14.3 Interaction quality (IQ map). (After Manzini, 2015, 109)

ous. It would be exhausting to live one's life entirely in that way. The key issue is to make, and help others make, considered choices about collaborative engagements.

Figure 14.3 maps a similar space but for *interaction quality*. This is a less elaborated construct in Manzini's work: the space is rendered simply in terms of the strength of social ties and the quality of the relationship (deep, warm and personal or formal and rule-defined). A reason for this may be that the dimensions of PI have the capacity to frame deliberate action in advance, whereas those of IQ reflect something more emergent: qualities that become clearer in and after the fact. Indeed, Manzini's examples say more about the warmth or depth of connection in an encounter as experienced, and rather less about characteristics of the arrangements that might be recognisable or clearly specifiable a priori. (One can make a deep and warm connection with someone even in a highly regulated, formal situation.) As with PI, none of these arrangements is *intrinsically* better. For example, being able to collaborate in weak-tie situations makes life more open and less tribal.

Manzini's work on mapping collaborative encounters is an expert designer's contribution to the toolkit of people who manage professional learning networks – whether on their own behalf or for the benefit of others. He did not intend it as such, but what transpires in learning networks is a significant instance of collaborative encounters more generally.

Synergies in Professional Work and Networked Learning

A key purpose for professional learning is to help professionals become better at providing services: learning to act more effectively, more efficiently, and in keeping with evolving professional standards. It is not unusual for professional learning to be done in a collective way – for example, through participation in seminars, advanced courses and conferences. There is now an extensive history of *networked* professional learning, stretching back from the late 1980s to the early 1990s. One can also point to large-scale R&D projects in networked professional learning, such as JITOL and SHARP, which experimented with tools and methods for sharing professional knowledge (including know-how) within geographically distributed communities of practice (Goodyear, 2014). Network Improvement Communities (NICs) are a more recent manifestation (Penuel & Gallagher, 2017). As with more conventional, face-to-face, forms of collective professional development, these professional learning networks have found ways of navigating the contours of co-operation and competition. Participants may share 'pre-competitive' knowledge in order to advance the field as a whole, but keep to themselves the knowledge that sustains individual competitive advantage. In short, professional learning networks are characterised by a managed and/or negotiated openness. Such dynamics underlie some of the movements in the PI and QI spaces shown in Figs. 14.2 and 14.3.

Earlier in the chapter, I also developed a version of Manzini's argument that the levels of collaborative social innovation needed to transform current economic and social arrangements into something more sustainable require new distributions of design activity. If we apply that argument to networked professional learning, a plausible trajectory is as follows:

1. We can imagine an exponential growth in the provision of professional services to self-directed community groups and networks: networks as clients.
2. Such professional contributions are still likely to take the form of co-designed and co-produced services. Indeed, they are likely to be both more open and more directly engaged or embedded in the social innovation activities of the network.
3. So professional activity in and with client networks will also have a community-strengthening or relationship-strengthening character and function.
4. And will help provide and improve both sense-making systems and platforms for action. Professional involvement in the activities of a client network will entail both inquiry (sense-making) and action in the world.

This educative or learning (sense-making) dimension to professional work turns out to be very pervasive. Professionals turn to their networks to learn things that will help them improve their own practice and to engage with peers in activities that combine collaborative inquiry, discussion, reflection and action in the world. The people – networked learning practitioners – who help such networks function have a more obvious pedagogical remit, but they too have and take opportunities to learn how to improve what they do: among other things, through their own learning networks. And those who carry out forms of research that are intended to improve the functioning of learning networks occasionally generate useful ideas – to be tested in practice – but they are also themselves active networked learners, picking up new concepts, methods and tools from others. Of course, one could push these similarities more strongly, and say that there is just one big complicated learning network. Without wanting to imply any sense of hierarchy or dependency, I think it is more helpful to say that there are still some clear roles and obligations – much still depends on who pays the salary and what outcomes are expected – so that we don't lose sight of the distinctive positioning of researchers, designers, teachers, professionals and their clients. But what we must not let that obscure is that *everyone* involved in networked learning is learning and helping others learn and that this learning activity has at least two foci: the learning task at hand and improving the efficacy of the network(s) in which that is happening. Nor does the extensive, widely distributed nature of the learning activity (sense-making, acting in the world) undermine the value of specialised or expert knowledge, or proficiency, in activities such as research and design.

Concluding Comments

In this chapter, I have argued that professional work often has a designerly quality. It frequently involves inquiry, reframing and action. Design inquiry combines a search for what is true, what is real and what is ideal. Design action involves composing and connecting: bringing people, tasks and things into a unified whole. I have also positioned design as an expert professional activity (offering a professional service) and as a vernacular activity (everyone designs).

The designerly work of professionals and the service work of (expert/professional) designers often involves:

- Co-designed services (and therefore co-inquiry and co-action)
- Collaborative services
- Relational services

Design research operates at two levels: an object level (level 1) – characterized by inquiry into 'the current problem' – and a meta-level (level 2), where the purpose is to improve design work in the future. Networked (professional) learning also operates at two levels: collaboration with others to learn how to tackle the current task and collaboration with others to improve one's capabilities for tackling future

tasks. Combining these perspectives, we can sketch a future for networked professional learning with social innovation at its heart and the co-design of collaborative services as its unifying practice.

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