

Sociomaterial Approaches to Conceptualising Professional Learning, Knowledge and Practice

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Why focus on *professional* learning, and why does it need reconceptualising?

Professionals’ knowledge and decisions influence all facets of modern life. As Abbott (1988) expresses it, the professions have come to “dominate our world. They heal our bodies, measure our profits and save our souls”. Some might argue that professionals’ learning and work is not terribly different to other vocational practitioners. However, an important distinction is wielded by the internal and external regulation of professionals’ knowledge, relationships and performance, and ultimately, their public accountability for what they know and do. This accountability has increased and shifted to more organisationally-driven audit of performance outcomes, along with other fundamental changes to conditions of professional practice influenced by market pressures, network arrangements, declining discretion and public trust, new public managerialism and so forth, as many have argued (*inter alia*, Adler et al 2008, Brint 2001, Evetts 2009, Freidson 2001). At the same time the body of shared professional knowledge is not stable but increasingly challenged and subjected to continual transformations. New digital technologies, new textual audit regimes, proliferating transnational and virtual knowledge resources, interprofessional practice with its corresponding knowledge conflicts and new knowledge requirements - such pressures are all raising questions about the complexities of professional knowledge and knowledge strategies.

We are among those who accept, first, that professional practice is a particular domain of vocational learning and work, and second, that professional practices and knowledge are shifting dramatically in ways which have important implications for education. Further, we hold that certain conventional conceptions of professional learning are limited both in understanding different professionals’ challenges of learning in practice, and in promoting forms of professional education that can truly support their preparation for and continuing responses to the radical challenges confronting them.

We therefore argue for some reconceptualisation of professionals’ learning. This special issue brings together researchers working with what we are calling ‘sociomaterial’ conceptions of practice and learning. These range from a more socio-cultural to a more material emphasis: Schatzki’s (2001) and Bourdieu’s (1990) conceptions of practice, various generations of activity theory, Knorr-Cetina’s (2001) concepts of epistemic cultures, actor-network theory, and complexity science. Each paper focuses on arrangements of professional and inter-professional practice, using theoretical resources like these to foreground key aspects of professional learning that might better inform education for professionals.

This introduction is intended to set the stage, so to speak, for these papers. First, we review the kinds of changes to professional practice conditions that we believe to be most significant in understanding their knowledge and learning. Then we outline conceptions of professional learning that have proved popular and useful in recent decades but which, we maintain, do not always address the emerging complexities of their practice. We then turn to introduce more fully what we mean by sociomaterial conceptions of practice and learning, and to show how each paper in this special issue contributes to expanding and enriching understandings of professional learning through such conceptions.

How and why are conditions for professional practice changing?

There are several societal trends that contribute to change the conditions for professional practice and learning. One of these concerns new forms of management, which is related to shifts in arrangements and responsibilities between the professions, the state, and the markets for professional services. In many countries professionals have experienced a shift from profession-internal control and regulation of work towards external audits and performance measures (Brint, 2001; Dent & Whitehead, 2002). The new public management discourse is spreading also in the professional sector, and gives rise to a 'customer-orientation' in the provision of services as well as to new accountability regimes in which the individual practitioner's work can be audited by clients and public agencies. This development is deeply at odds with the values of autonomy and discretionary decision-making historically associated with professionalism (Freidson 2001; Evetts, 2002). Researchers have expressed worries that this development over time may lead to deskilling, because the use of external performance indicators give rise to direct regulation of work which in turn may decrease the space for professional judgement (e.g. Strathern 2000; Carey 2007; Broom et al. 2009).

At the same time, however, there are signs that professionals are entrusted with new responsibilities and presented with new opportunities for engagement. One aspect in this regard concerns the manners in which knowledge is developed and circulated in professional communities. The basis for professional work today lies, as in previous times, in the capacity to perform work in ways that are informed, guided by, and validated against shared knowledge and established conventions for practice. At the same time, it is generally recognised that the knowledge of a profession is not stable but rather contested and subjected to transformations in a continual manner. On the one hand the pace of knowledge production in today's society generates a wide range of knowledge resources that potentially may support professional practice. On the other hand it also creates a manifold of partly conflicting evidence which lives and circulates in complex networks. As a result, the available resources for learning and professional development are potentially richer than ever, at the same time as knowledge increasingly is marked with insecurity and the identification and integration of different knowledges to address specific professional challenges is increasingly more demanding. This development invites professionals to take on new responsibilities for knowledge, and opens at the same time new opportunities for engagement. Several professions now reorient themselves and establish closer links to science, which may bring new knowledge objects to work and open for more creative-constructive modes of practice which go beyond routine (Knorr Cetina 2001).

A third issue concerns shifts in the organisation of professional work. In recent years, inter-professional work has emerged as a way of handling complex problems and needs in society which require contributions from several areas of expertise (Edwards 2010, Guile 2010, Lee and Dunston 2010). Practitioners are increasingly required to work with others who bring other forms of expert knowledge to the collaborative practice. This shift in work organisation challenges the boundaries of the professions as expert domains, but boundaries may at the same time be recreated in new ways as practitioners are positioned to represent their specific area of expertise in the collaborative work (Bechy 2003; Mørk et al. 2008)

In the wake of these trends, there is a need to understand professional practice beyond individuals' discretionary decision-making, beyond stable communities and beyond given knowledge. We need to account for the dynamics of knowledge and materiality 'on its travels', as well as for the multiple and the creative-constructive dimensions of practice. At the same time, a core challenge for professionals is to maintain continuity in professional work. This requires stabilisation of knowledge and practice. An emerging question is thus how stability is achieved in practices characterised by multiple knowledge sources, strategies and concerns, while enabling innovation.

What conceptions of professional learning and practice have most informed analysis?

The sociology of professions has provided important insights into the norms and moral foundation of professional practice as well as aspects of trust, and professionalism as a means for occupational closure and control (Abbott 1988; Freidson 2001; Evetts 2006), and has drawn attention to significant shifts in professional practice that can be assumed to affect knowledge and knowing practices. However, research within this line of theory development has so far failed to account for the dynamics of knowledge and professional expertise (Adler et al. 2008). – the epistemic dimension. The emergence of global knowledge societies is related to the spread of certain 'epistementalities', that is, beliefs about the production and distribution of knowledge that operate across institutional boundaries and constitute new organisational arrangements of roles and agencies (Knorr Cetina 2007). To date however few studies have addressed these shifts in the context of professional work and learning.

In professional and vocational education, it has become commonplace to refer to perspectives of 'participation' in learning as being superior to perspectives of 'acquisition' of knowledge (Hager 2004), despite the continued prevalence of the latter orientation. When professional knowledge first began to be taken seriously as not only a disciplinary canon of principles and evidence-based practice to be acquired (e.g. 'Mode One knowledge' from Gibbons et al. 1994), but also as something continuously emerging through experimental participation in practice itself (e.g. Mode Two knowledge), a new excitement emerged. Professionals reflect in and on their everyday decisions and interactions, Schon (1983, 1987) argued, and through this ongoing 'reflective practice' they create knowledge that responds to the 'the swampy lowland [where] messy, confusing problems defy technical solution (1987: 28). Thus were launched volumes of analysis and prescription for professionals' reflection on practice, which became orthodoxy for professional education and continuing professional development (CPD)

that continues today in many sectors. While the importance of its contribution is well established, critics have long pointed out various problems with reflective practice as a dominant model for professional learning: separating mind from body and thinking from doing in what is essentially a narrow mentalist view of learning; over-simplifying processes of both reflection and of practice; prescribing a universalist process that suits only a few; providing little specific assistance for developing specific expertise and strategy; compelling practitioners to 'reinvent' wheels and consigning them to subject positions of ever-continuing development (Fenwick 2003, McWilliam 2002). Other conceptions such as Eraut's (1994) strategies for developing professional expertise, and Clandinin and Connelly's (2000) emphasis on story to understand and develop professionals' personal-professional landscapes of knowing, have enjoyed broad uptake in the past two decades.

But the problem of context kept emerging in all of these conceptions. Despite theorists' efforts to acknowledge the interplay of professionals' learning with their environments, the emphasis always landed back on the individual practitioner, or more essentially the individual's mind, as the hero of the learning story. Thus professional education and CPD continued, indeed continues, to reflect this individualist, subject-centric, psychological conception of knowledge and practice, despite recognition that these are distributed, material and relational. An influential breakthrough occurred with Lave and Wenger's (1991) insistence that knowledge in work is entwined with activity, tools and community. Through subsequent developments of this 'situated' or 'participational' conception of professional learning, a new orthodoxy emerged in the form of 'communities of practice' (CoP) (Wenger 1998) which became widely adopted in prescriptions for professional learning communities (for review and critiques see Hughes et al. 2007). *CoP*, however, fails to adequately account for the complexities of both practice and community. The power relations comprising communities that enable or exclude particular practices and knowledges are little recognised. Learning is often assumed to occur in a one-way direction from outside-in as newcomers become inducted, a premise which explains neither innovation nor internal resistance. Moreover, *CoP* presents communities as single, localised and bounded fields of practice, which implies that practice is understood within these boundaries rather than as constituted as complex relations and movements across multiple sites. *CoP* is also, despite its mention of tools and activity, primarily oriented towards social aspects without accounting sufficiently for the material and epistemic aspects of work and learning, or for transformations in knowledge over time.

Alongside but apart from the *CoP* analyses, theories of professional learning in the past decade have been developing what some have heralded as a 'practice turn' (Schatzki, 2001: 2), which examines 'embodied, materially mediated arrays of human activity centrally organised round shared practical understanding'. These have been raising questions about what constitutes participation and 'knowing-in-practice' (Gherardi 2006) in diverse professional activities, and how practice improves or become transformed. Once a practice has become stabilised, new adherents are inducted into its routines and objects in ways that do not necessarily enable, or even endorse, transformative energies of resistance, creative adaptations, or subversion. The whole notion of 'practice-based learning', then, could end up promoting what is essentially a highly reproductive, a-critical direction where what is valued as the most important knowledge and skill is

simply that which ensures the continued dominance of historical routines and hierarchies. The notion of ‘participation’ is as tricky as the balance of continuity and transformation in professional practice and knowledge. Material considerations of participation foreground not only the material dimensions of human activity and human bodies but also the non-human participants in a practice: texts, instruments, technologies, furniture, weather, etc. What different forms of participation (and partial or non-participation), on the part of both human and non-human actors, are possible in holding together a practice? What forms of participation bring about change or dissolution of a practice? What different modes of participation are linked with different forms of learning? How do different locations of participation, from outside or inside a practice, affect learning? Taken further, the question of participation’s relation to practice invites questions about the distinction between a *practice*, the process of *practicing*, and the state of being *practiced*: what does it mean to participate in these different modes, and what are the implications for professional learning?

What are ‘sociomaterial’ perspectives, and what can they contribute to understanding and supporting professional learning?

Theories that specifically trace not just the social but also the material aspects of practice can be helpful in beginning to address such questions. Materiality includes tools, technologies, bodies, actions, and objects, but not in ways that treat these as ‘brute’ or inherently separate and distinct from humans as users and designers. Materiality also includes texts and discourses, but not in ways that over-privilege linguistic, intertextual and cultural circulations. Overall, a foregrounding of materiality helps to avoid putting human actors and human meaning at the centre of practice. It avoids treating material things as mere appendages to human intention and design, or as traces of human culture. Among perspectives that seem to be part of this pervasive shift, the material world is treated as continuous with and in fact embedded in the immaterial and the human. Therefore in this discussion, the term ‘sociomaterial’ is used to represent perspectives that are argued to form part of this shift.

Sociomaterial perspectives tend to examine the *whole system*, appreciating human/nonhuman action and knowledge as entangled in systemic webs, and acknowledging the processes of boundary-making and exclusion that establish what is taken to be a ‘system’ and its ‘elements’. Second, most focus on closely tracing the formations and stabilisation of elements – all bodies including knowledge - that are produced, reinforced or transformed by subjects that emerge with/in a particular activity. That is, they all trace *interactions among non-human as well as human* parts of the system, emphasising both the heterogeneity of system elements and the need to focus on relations, not separate things or separate individuals. Third, they all understand human knowledge and learning in the system to be embedded in *material action and inter-action (or intra-action)*, rather than focusing on internalised concepts, meanings and feelings of any one participant. In other words, they do not privilege human consciousness or intention, but trace how knowledge, knowers and known (representations, subjects and objects) emerge together with/in activity.

In terms of understanding practice and practice-based learning, a key contribution of sociomaterial perspectives is to de-centre the human being in conceptions of learning, activity and agency. As argued elsewhere (Fenwick, Edwards and Sawchuk 2011), these perspectives trace how disparate elements – human and non-human – emerge in webs of activity, and become linked into assemblages that collectively exert power and generate knowledge. The question of *kinds* of practice, and of distinctions between ‘practice’ and ‘practicing’, are tied up with different processes of materialisation and material assembly. The question of *participation* in practice is broadened far beyond a focus on personal and social engagements to trace how things themselves participate to produce and sustain practices, often in ways either overlooked by humans, or assumed to be controlled by humans. But when we begin to appreciate how a confederate agency of things participates in ways such that human action and intention are interlinked but not central, we can see multiple networks of influence upon any given encounter. Encouraging human participation, then, becomes far more a matter of attunement to things seen and unseen, a sensibility to what may be far-reaching consequences of inadvertent human interactions, or a sense of building relations and understanding delicate responsibilities, than a brute assertion of human intention and control. Finally, the question of how a practice becomes reconfigured or transformed is addressed at the nexus of sociomaterial connections. With their diverse emphases on emergence, translation and expansion, these theories tend to conceptualise change as a series of complex negotiations at micro-levels setting in motion complex dynamics that reconfigure systems. They trace the actual dynamics through which powerful entities and linkages are assembled, reassembled and occasionally transformed, showing how they can be disassembled but also moved forward in the course of assemblage. Importantly too, each of these theories shows the interplay between stabilisation and dynamism. That is, they show both how practices become fixed and durable in time and space, but also the way in which disordering elements and disequilibrium emerge to enable radical new possibilities. These sorts of analyses are particularly helpful not only in understanding just how practices can change, but also in distinguishing among kinds of practices that play different roles in stabilising or disordering a system, in making connections or amplifying disturbances, and in attuning to ambivalences and uncertainties – the openings for unknown possibilities.

In this regard the epistemic dimension of professional practice is of special concern. Professionals are increasingly involved in developing and securing knowledge as part of their everyday work, and become enrolled in different types of knowledge practices when they open up questions for exploration, when they explore knowledge beyond what is known, and when they document their work to achieve continuity in professional services. The perspectives employed in this issue allow us to examine the constitutive role of knowledge objects upon professional work, in ways that link local practices with wider circuits of knowledge. Such objects derive from epistemic cultures of various kinds, and incorporate the logics and arrangements through which knowledge comes into being, is circulated and collectively recognized in the given culture or community (Knorr Cetina 2001; 2007). Through the circulation and materialisation of epistemic objects in professional settings, collective ‘epistementalities’ emerge which premise professional practice and guide practitioners’ learning. Several contributions in this issue pay attention to the role of epistemic cultures and objects in the development, regulation, enactment and ways of envisioning professional knowledge and expertise.

What is the contribution of this special issue?

A few of these theories emphasising social activity and materiality in workplace learning research have appeared before in the *Journal of Education and Work*. For example, the activity theoretical conception of ‘expansive learning’ published by Engeström (2001) has been enormously influential both in shaping conceptions of workplace learning and in generating critique that also appeared in *JEW* (e.g. Avis 2007). Knorr Cetina’s conceptions of ‘object centred sociality’ have been featured in *JEW* (Jensen and Lahn 2005). In this special issue, authors draw respectively from these and other sociomaterial perspectives of actor-network theory, socio-cultural and activity theories, complexity science, and Knorr Cetina’s notion of ‘epistematerialities’. These perspectives bear some similarities in their conceptualisation of knowledge and capabilities as emerging – simultaneously with identities, policies, practices and environment – in webs of interconnections between heterogeneous knowledge worlds. Each paper actually pushes well beyond the basic precepts of these individual perspectives to extend, combine and question them. Working in this fashion, authors discuss how professional learning can be reconceptualised as a matter of negotiating different knowledge resources ‘assemble’ strategies, values, objects and relations. Each illuminates very different facets of the sociomaterial in professional learning that can afford important understandings: about how professional subjectivities are produced in work, how knowledge circulates and sediments into formations of power, and how practices are configured and re-configured. Each also signals, in different ways, what generative possibilities may exist for alternative professional knowledges and counter-configurations of practice.

Silvia Gherardi opens the special issue by exploring in new ways her own well theorised concept of ‘knowing-in-practice’, working from an empirical analysis of telemedicine in practice. She delves into the sociological roots of understanding practice as sociomaterial, including the logic of practice and practical reasoning, drawing on a range of theorists such as Bourdieu. As she probes the ways medical professionals treat important activities as core or at the margins within their logic of practice, she uncovers links between these distinctions and the dual movements of stabilising practice while continually reforming it.

Anne Edwards and Harry Daniels focus on what they call *The knowledge that matters in professional practices*, drawing from empirical studies of inter-professional work in children’s services. The paper departs from cultural-historical activity theory (CHAT), supplementing it with analytical resources from the sociologists Bernstein and Knorr Cetina to better account for how knowledge is valued and comes to matter in inter-professional practices, and how it is imbued with purposes and affective concerns. From Bernstein, the authors employ the concepts of instrumental and expressive discourse to theorise how institutional discourses incorporate both instrumental and affective dimensions, and how they regulate the knowledge that can be used to mediate and enact professional work. From Knorr Cetina, the authors employ her notion of how practitioners may develop emotional affiliations with knowledge in practices that go beyond routine. By doing so, the paper expands more well known CHAT analyses with

analytical approaches that highlight the constitutive role of knowledge and motives in professional practices.

The next paper by Åsa Mäkitalo is also based in socio-cultural theories of human activity and the social formation of the human mind derived from Vygotsky, here focusing on empirical examples in three professional situations: an IT helpdesk team in a multinational company; vocational guidance officers in a public employment office; and hospital nurses at a rehabilitation ward. However, rather than foregrounding inter-professional work through the lenses of activity theory, Åsa focuses on the constitutive role of language and material-semiotic tools in professional practice working through Wertsch's concepts of explicit and implicit mediation. She explores three aspects of professional work with respect to language and written texts: the sociomaterial coordination of perspectives and action, meaning-making in achieving shared understanding, and bridging gaps in collaborative work. The paper contributes by re-working well-established theoretical accounts of tool-mediated action, showing in detail how these may be employed to study pressing challenges in professionals' collective work.

David Guile also premises his discussion on activity theory, this time with a Le'ontev stance, to analyse empirical studies of inter-professional learning in work arrangements such as short-term projects and 'co-configuration'. Once again activity theory is stretched in new directions through incorporation of other conceptual contributions such as David's own theory of 'recontextualisation'. He also borrows from Adler and his colleagues who theorise new forms of professional 'collaborative community' that are distributed, temporary and heterogeneous. He further integrates Bauman's idea about professionals' 'dual dilemma' between upholding their own disciplinary knowledge tradition while translating their knowledge into accessible forms for others. Overall, his contribution is to synthesise these conceptions to trace the knowledge work of interprofessional teams as sociomaterial distributed cognition, and to show the related challenges and strategies for professional learning.

Monika Nerland and Karen Jensen focus on how professionals today become engaged in epistemic modes of practice, and are presented with responsibilities for developing and securing collective knowledge, illustrated with empirical examples from nursing. Using the theoretical orientations of Knorr Cetina and associates, these authors show how knowledge is produced and circulated in distinct ways in expert communities. Professional practice thus is embedded in complex sociomaterial dynamics of knowledge that are present within, but reach beyond, local work. In particular, Monika and Karen illustrate i) how practitioners develop knowledge and practice by engaging with epistemic objects, ii) how relations with objects give rise to community formation, and iii) how object relations link practitioners with a wider knowledge world. This analysis shows how knowledge practices stretch beyond the boundaries of local communities or work organisations, which is increasingly important to account for in a complex society based on a multiplicity of network structures, agencies, and sites of knowledge production.

Dianne Mulcahy similarly focuses on empirical examples from a single profession, school teachers' practices in her case. She theorises a similar issue to the preceding paper: how do professionals enact these new and conflicting knowledge responsibilities. However, her theoretical wellspring is actor network theory, particularly its most recent developments. Dianne departs from conventional discourses of teacher learning that separate meaning and matter to conceptualise professional learning as a 'performative knowledge practice' constituted and enacted by people and tools in complex sociomaterial collectives or assemblages. As her analysis shows, a sociomaterial approach to observing, representing and experimenting with professional practice and knowledge, in its different forms of assemblage, can both 'challenge utilitarianism and technicism and the materials through which they are mobilised', and highlight significant but often marginalised practices.

Tara Fenwick turns to complexity science, analyzing a variety of studies of professional learning and education that have employed complexity concepts to ask critical questions about the utility of complexity science in researching professionals' practice. The focus here, as in so many of the papers, is interprofessional learning. The contribution is an illustration of how particular notions from complexity science such as 'nested systems' and 'emergence' can foreground fundamental sociomaterial dynamics that configure practice and opportunities for interprofessional knowing in practice. A major question is raised about the extent to which complexity concepts can illustrate the politics and systems so important to understanding professional responsibility – the knowledge that matters.

Overall, each paper in this special issue shows specific pressures on professionals' learning in different occupational contexts ranging from public school teaching to creative industry professionals. These pressures are wrought by changing regulatory frameworks, changing modes of organising, changing demands and changing knowledge authorities in professional practice, all of which necessitate a renegotiation of the relations among work, education and learning. The authors stress the importance of understanding professional knowledge and knowing practices through material dimensions, not just the objects and texts interwoven with their activity, but the sociomaterial webs through which the important moments of professional action and decisions emerge. In general, the papers as a collection show how much professional practice now is being done collaboratively in all sorts of different configurations. Complex distributions and discontinuities of professional knowledge and community emerge amidst these collaborations, in the midst of market and managerial discourses. This moves us beyond accepting 'learning' as an identifiable, singular phenomena to grappling with messy multiplicities around professional practice 'standards' and 'quality', workarounds, responsibility, agency, and knowledge practices. Here is where sociomaterial perspectives become particularly relevant, in opening new questions and methodological approaches that can both highlight what is often invisible in these messy dynamics of professional learning, and point to new ways of conceptualising policy and educational supports for professionals.

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