

# Extending Learning and Innovation: Communities of Practice & Actor Networks

**Create Innovation** is a UK based organisation specialising in innovation research, knowledge exchange and training. We support commercial, educational and non-for-profit organisations in identifying and developing the social and cultural practices that enable the creation of innovative products, services and processes.

Our research programmes, workshops and seminars utilise methods from the Arts, Humanities and Social Sciences to provide our clients with the necessary tools and strategies to explore diverse social and material environments in the process of developing innovative practices.

Find out more at [www.createinnovation.org.uk](http://www.createinnovation.org.uk)



**Open access. Some rights reserved.**

As the publisher of this document, Create Innovation wishes to encourage the circulation of its work as widely as possible while retaining the copyright. We therefore have an open access policy which enables anyone to access our content online without charge.



Create Innovation gratefully acknowledges the work of Creative Commons in inspiring our approach to copyright. To find out more go to [www.creativecommons.org](http://www.creativecommons.org)

## EXTENDING LEARNING AND INNOVATION: COMMUNITIES OF PRACTICE & ACTOR NETWORKS

*The problem for each practice is how to foster their own force, make present what causes practitioners to think, feel and act. But it is a problem which may also produce an experimental togetherness among practices, a dynamics of pragmatic learning of what works and how. This is the kind of active, fostering 'milieu' that practices need in order to be able to answer challenges and experiment changes, that is to unfold their own force.*

**Isabelle Stengers**

This paper sets out to explore two analytical methods for identifying and extending learning and innovation within organisations. During the last twenty years learning practices have proven themselves to be a significant force in the process of creating and developing new forms of innovation within organisational settings. During the same time, two distinct yet similar methods for analysing and describing organisational dynamics and learning processes have emerged as potential tools for understanding these specific entities and activities. Historically, the investigation of learning processes has been dominated by psychology, which as we will establish, has been to both the exclusion and detriment of many socially orientated approaches. Both Communities of Practice Theory (COPT) and Actor-Network Theory (ANT) provide rich socially analytic foundations from which to explore the symbiotic relationship between learning and innovation within organisational environments. In this paper we will focus on what is both common and divergent in their conceptual approaches, as well as how their distinct 'modes of analysis' offer radically different perspectives on the notion of social context.

### **Introduction**

The relationship between learning practices and the process of innovation is both complex, and in most cases, largely hidden. Both the complexity and the lack of visibility in this relationship are manifested through perceived instances of variability. What is known or learned (existing knowledge) contrasted with what is unknown or created (new knowledge) often presents itself as a singular experience of unique insight based on certain conditions and contingent factors. The well exercised metaphor of the 'light bulb moment' gives weight to this account by its place as a stubborn motif in numerous historical narratives of innovative practice. The 'light bulb moment' often occurs without recourse or understanding for the learning processes that have weaved together many variable experiences, environments and artefacts in the dynamic process of innovative thought. Over the last twenty years a number of theories have emerged that attempt to render visible the process of learning as the basis for a radically different networked account of the development of innovation.

### **Social Learning and Communities of Practice**

During the timeframe identified above, Jean Lave and Etienne Wenger's (1991) situated learning theory has become a significant body of work within the broader field of social learning theory. Social learning theory has attempted to examine learning processes within their social and situated contexts, which means considering accounts of learning that exist outside of formal educational settings, such as the traditional lecture or classroom. Social and situated learning thus draws our attention to learning processes that take place at the

level of the 'everyday', in environments such as workplaces and social communities. Collectively, these ideas suggest that our understanding of learning processes can no longer be the exclusive preserve of psychology and that different accounts and narratives of learning need to be established. The principal element of Lave & Wenger's situated learning is the concept of 'community of practice', in which individual members of a community learn by participating in shared activity. Within COPT the link between learning and innovation is a significant one, as learning is considered to be situated within a social context, providing a rich foundation from which the process of innovation can potentially flourish.

In their seminal paper on organisational learning, John Seely Brown and Paul Duguid (1991) attempt to identify what they see as the integral component that links learning and innovation within organisational settings. The authors begin to establish this link by suggesting that we reconsider the inter-relationship between notions of working, learning and innovating, to see that these activities are 'inter-related and compatible and thus potentially complementary, not conflicting forces requires a distinct conceptual shift.' This shift proposes a wholesale movement away from abstracted representations of these activities to accounts that consider previously excluded narratives that are based on actual practice. As they state,

we suggest that practice is central to understanding work. Abstractions detached from practice distort or obscure intricacies of that practice. Without a clear understanding of those intricacies and the role they play, the practice itself cannot be well understood, engendered (through training), or enhanced (through innovation). (p.40)

The positioning of practice as a central unit of analysis is common to both COPT and ANT. Both theories/methods place *concrete* practices at the heart of their analytical frames, which to some extent makes their approaches complementary, although as we will later suggest, their theoretical positions in relation to the nature of practice and social context are radically different. The notion of practice is clearly a significant component of COPT, as Wenger has stated, 'practice is, first and foremost, a process by which we can experience the world and our engagement with it as meaningful' (1998: 31). Within Wenger's view, practices are considered to be profoundly social, which means they are produced and reproduced within and through a 'system of relations'; they are the product of a distinct history that represents a particular way of doing things (Wenger, 1998). Practices in this sense refer to what Wenger describes as 'communities of practice'. Communities of practice are collective ways of doing things that binds individuals, groups and organisations together whilst providing meaning to their actions and aiding learning in both explicit and tacit modes.

From this practice-based standpoint, Brown and Duguid (1991) position learning as the link (or bridge) between working and innovating, and following Lave and Wenger's research, they emphasise that to 'understand working and learning, it is necessary to focus on the formation and change of the communities in which work takes place.' Furthermore, that the 'composite concept of "learning-in-working" best represents the fluid evolution of learning through practice' (p.41). COPT is, therefore, the central component of their thesis, and it is worth unpacking their argument in more detail to outline how both COPT and ANT can operate as different tools for extending the practices of learning and innovation within organisational settings. Their argument opens by identifying two different types of organisational practices, what they refer to as canonical and non-canonical practice. The difference between the two types is identified as that which is considered espoused practice (canonical) and that which is actually practiced (non-canonical). Although slightly misleading, as we shall later discuss, this distinction is crucial for understanding their emphasis on the process that occurs between working, learning and innovating and the role communities of practice play within that process. To give some theoretical weight to this distinction the authors enlist the support of Pierre Bourdieu and his distinction between *modus operandi* and *opus operatum*, as well as his analogy of perceiving the difference in a 'journey as actually carried out on the ground and as seen on a map' (Brown & Duguid, 1991: 41).

*Opus operatum*, as opposed to *modus operandi*, 'tends to see the action in terms of the task alone and cannot see the way in which the process of doing the task is actually structured by the constantly changing conditions of work and the world.' (Brown & Duguid, p.41). *Modus operandi*, however, holds within its meaning the idea that the action is the product of 'ways of doing things' and thus potentially accounts for both the changing conditions and context in which the action is 'situated'. In their words, this account of 'actual practice inevitably involves tricky interpolations between abstract accounts and situated demands' (p.42). In terms of the journey/map analogy, 'the map, though potentially useful, by itself provides little insight into how ad hoc decisions presented by changing conditions can be resolved.' As the journey becomes more complex, 'the map increasingly conceals what is actually needed to make the journey.' (p.42). This distinction then, between the canonical and non-canonical, the espoused and the actual, the formal and informal, lies at the heart of COPT in terms of its capacity for identifying learning and innovative processes.

To unpack the details of these processes further we shall first focus on COPT and its central place within Brown & Duguid's thesis, as it will allow us to later establish further similarities between COPT and ANT, before then turning to the significant differences in how each method theorises social context as the basis of learning.

After their initial problematisation of practice, Brown & Duguid move on to some specific instances (case studies within different industries) of how this dual notion of practice manifests itself in organisational learning. They use a number of examples to highlight how the canonical or formal approach to learning is theorised in terms of the

transmission of explicit, abstract knowledge from the head of someone who knows to the head of someone who does not in surroundings that specifically exclude the complexities of practice and the communities of practitioners. (p.47)

This description of traditional learning theory posits the representation of individuals internalising knowledge through of a range of psychological processes. These processes are typically framed as (1) transmission (training, teaching) that leads to (2) input, storage in memory, internalisation of what's transmitted, followed by (3) retrieval and transfer to problem solving in new situations (Lave, 2003). Within COPT this view of learning is subjected to a number of critical developments that exist within the general field of social learning theory, which states that the active negotiation of meaning is considered integral to the learning process. It is this active negotiation of meaning through shared practices and experiences that is central to COPT. This view of meaning is conceptualised as fluid and changing as opposed to fixed, stable and unproblematically transferrable. The process of producing meaning is always negotiated in and through existing social, historical and cultural contexts, however, the potential for creating meaning within these contexts is evidently dependent upon prior experience, both individual and collective. In this respect the process of learning is seen as relational and situated, which is to say, that it is the by-product of participation in social practices where meaning is ultimately shared. As Brown & Duguid state,

From this perspective learners can, in one way or another, be seen to construct their understanding out of a wide range of materials that include ambient social and physical circumstances and the histories and social relations of the people involved. (p.47)

This element of construction within COPT situates itself as the basis for learning practice. Lave & Wenger (1991) develop the concept of *legitimate peripheral participation* as the supporting mode of this process. According to Brown & Duguid, this concept does not function as a mode of education, but as an analytical tool for 'understanding learning across different methods, different historical periods, and different social and physical environments.' (Brown & Duguid, 1991: 48). This approach makes the conditions of learning central to

understanding what is learned. The similarities shared with ANT at this stage are significant, as we shall demonstrate later. Learning, from this standpoint, does not pursue the 'acquisition' of abstract knowledge but the constructive participation in a community, whether that be physicists, midwives or librarians, it is the experience of 'enculturation' that is significant. The narratives and activities of these working practices, the ways of 'saying and doing' provide the basis for constructing knowledge and understanding through the means of legitimate participation.

Brown & Duguid exploit this concept (legitimate peripheral participation) for the basis of the central link between working, learning and innovating in their thesis. It is this informal peripheral participation exercised within communities of practice, coupled with their shared desire to work more effectively within what is common to their collective practice, that is significant in this activity. Brown & Duguid state that this process of development is inherently innovative, as these peripheral communities offer the core of a large organisation a means and a model to examine the potential of alternative views of organisational activity through spontaneously occurring experiments that are simultaneously informed and checked by experience. (p.50).

Communities of practice develop a rich, qualified, informal view 'to bridge the gap between the organisation's static canonical view and the challenge of changing practice.' (p.50). Innovation, in this sense is not just a response to observations of the social and material environment, but 'lies on the interface between an organisation and its environment.' (p.51). Again, the similarities with ANT at this point are significant. How organisations identify and make use of these communities of practice for the benefit of value creation can differ immensely, but it is clear that COPT offers at least one way to look at organisations and identify the potential for learning and creating innovation embedded within them. It is worth noting at this point that innovative communities of practice tend to emerge through contingent circumstances and very rarely operate effectively through formal construction, as Brown & Duguid identify

The important interplay of separate communities with independent (though inter-related) world views may in part account for Von Hippel's account of the sources of innovation and other descriptions of the innovative nature of business alliances. Von Hippel argues that sources of innovation can lie outside an organisation among its customers and suppliers. *Emergent* communities of the sort we have outlined that span the boundaries of an organisation would then seem a likely conduit of external and innovative views into an organisation. (p.54, our emphasis)

It is the independent and self-organised nature, coupled with their transient position and emergent identity, that provides communities of practice with the potential for developing new forms of innovation. According to Brown & Duguid, COPT provides a set of conceptual tools that allows us to understand how communities of practice emerge and how tacit knowledge is created and distributed within these discrete communities. Their shared process of learning, through the activity of legitimate peripheral participation, can provide a rich resource of knowledge forming practice that can potentially inform and generate innovative processes providing the basis for long term value creation within changing organisational structures.

The case for positioning COPT as a foundation for both learning and innovative practices, as Brown & Duguid state, appears to be relatively strong. COPT has acquired a significant place in the pantheon of social learning theory, where increasing participation in a community of practice is the key to understanding how learning processes emerge and how new identities are formed within organisational settings. However, COPT does have its limitations, chief amongst which is its inability to account for the wider contextual relations in which the communities of practice themselves exist. To investigate how communities of practice emerge and what conditions are required to support their emergence we shall now turn to ANT as a practical method for

investigating the relationships and associations between organisations, communities and the social and material environments they occupy.

## **Actor-Network Theory and Social Context**

Actor-Network Theory was developed in the early 1980s as a contribution to the sociology of knowledge. It initially emerged as a method for attempting to understand processes of innovation and knowledge creation within the domain of Science & Technology Studies (STS). However, during the 1990s, it developed into an analytical tool that was used in many diverse fields, including management and organisational studies. Like COPT, it is a constructivist method that attempts to avoid reductionist and essentialist explanations for events or innovations. Although, it differs from COPT in that it deploys a radical material-semiotic approach that attempts to map the relations between material (things) and semiotic (concepts), whilst presuming that most relations are both material and semiotic. However, its most radical 'feature' is that it does not distinguish between the agency of humans and nonhumans (people and things), as it assumes all entities in a network can and should be described in the same terms. The main premise of ANT is that it mobilises the concept of 'actant' as opposed to 'actor', which allows it to extinguish the privilege typically assigned to human agency. It states that non-human elements (actants) also possess forms of agency which allows them to act upon things, as forces do in physics, in the sense that they have powers of inertia, resistance, attraction and repulsion etc. As an analytical tool ANT makes use of numerous conceptual formulations to perform empirical investigations in local and situated environments where the mapping of relations (material and semiotic) can provide new insights into the nature and structure of those relations, their processes and their potential affects and effects.

As an analytical tool, ANT deploys a diverse range of concepts including 'translation', 'generalised symmetry' and 'mediation' to configure and support its analyses (our secondary paper, *Social Complexity, Actor Networks and the SPACE Framework* explores these concepts in more detail). However, it is ANT's theoretical position on the nature of practice and social context, and how that differs from the position presented by COPT, that is of interest here.

As stated above the concept of a community of practice is predicated on the notion that individual members learn by and through participation in shared activity. A community of practice, according to Wenger (1998) differs from a profession, an organisation or a friendship. He argues that an important feature of a community of practice is that practice refers to a 'level of social structure that reflects learning' (p.126) and that the communities exist as the product of 'systems of relations' amongst people, which provide 'mutual relationships' that can be both 'harmonious' and 'conflictual' (p.121). Several theorists have begun to raise questions relating to both context and conflict as presented in COPT. Firstly, the notion of context, within COPT, is seen as static and underdeveloped, with its reliance on stable 'systems of relations' it tends to 'conceptualise context as a container within which learning as a cognitive process takes place' (Fox, 2000), rather than as dynamic material force that affects learning processes. A similar view of this static nature of context is expressed by Edwards (2005)

Communities of practice, discourse, place and focus communities, amongst others, have been developed as a way of framing learning. For some, these framings provide a too bounded sense of context and do not capture the relational nature of learning. (p.11)

Secondly, the issue of conflict has also raised a few points of contention. It has been stated that within COPT power relations remain too peripheral to provide a unified theory of the social structures through which the communities exist. The power relations that exist within a community of practice cannot be separated from a particular membership group and their identities, biographies etc (Fox, 2005). Lave & Wenger (1991) establish

this point during the development of their initial concept. 'We conceive of identities as long-term, living relations between persons and their place and participation in communities of practice. Thus identity, knowing, and social membership entail one another (p. 53). Within this 'system of relations' the potential for conflict is not made explicit, even though it is a necessity for the process of negotiation to function and provide the basis for new meanings and experiences to emerge from within practice. This point has been echoed by Fox (2005)

Communities of practice do not exist in a vacuum but exist within wider organisational or societal structures. Communities of practice theory itself does not provide a theory of this wider set of social structures although it recognises the need for a more adequate account of social world than provided for in most social learning theory (p.8)

The issue here is not to suggest that COPT is wrong or in some way misguided, but to identify that it cannot account for the broader systems of social, political and economic power that affect the emergence and existence of communities and practices. Wenger (1998) recognises this by stating that 'the extent to which such systems affect the lives of people through the communities and identities they construct' (p.190), although this only assumes the existence of an organisational system that has effects (Fox, 2005). Fox goes on to state that the application of ANT can 'offer further and complementary insights into the relations between communities of practice and the broader social, political and economic issues of the inter-organisational world' (2005: 9).

As we stated above, ANT as an analytical tool mobilises the concept of 'actant' as opposed to 'actor', which allows it to extinguish the privilege typically assigned to human agency. It states that non-human elements (actants) also possess forms of agency which allows them to 'act upon things'. This is not to ascribe freewill to objects, 'but to recognise that objects act upon other objects and upon humans' (Fox, 2005: 3). An actor network approach, therefore, has the capacity to describe both the broader and changing systems of relations within which actants (human and non-human) affect each other. ANT 'supplies a processual analysis of how networks are constantly being built and broken down, which upsets the assumption of a relatively stable system of relations' (Fox, 2005: 4). In this respect, Fox positions ANT as an alternative model for analysing learning practices, one that can 'illuminate' new forms of learning, whilst adding a material dimension to social learning theory.

Actor-network theory adds that 'social context' is to be understood as a thoroughly 'materialistic context'; that the social does not exist outside or transcend the material. Actor-network theory provides a way of understanding context that does not privilege the human element. The non-human element of networks is often (though not exclusively) the element which enables durability, immutability and irreversibility of networks. (Fox, 2005: 2)

This material reading of social context lies at the heart of the distinction between COPT's and ANT's 'modes of analysis'. Lave (1993) discusses this distinction for COPT in terms of the difficulty in handling the social and material context when she examines the difference between context as pre-given (before practice commences) and as emergent (through practice). Lave is not claiming that a concrete dichotomy exists between context as pre-given and emergent, but argues that there are differences of theoretical emphasis. Context 'can be even be treated as both pre-given and emergent simultaneously, but different forms of analysis select where to place the emphasis' (Fox, 2000: 858). However, ANT does not attempt to account for a pre-given objective socio-historical context, or indeed the existence of macro or micro actors on that stage, 'rather their existence is what analysis should seek to explain by reference to a set of nested practices (Fox, 2000: 858). Within ANT social context is always considered to be emergent through material practice, which cements practice to the

position of the primary unit of analysis within its empirical investigations. In this respect, if we return to Brown & Duguid's (1991) earlier distinction between canonical and non-canonical practice, we could perhaps conclude that through the lens of ANT the distinction between these formal and informal practices is dissolved, and that organisations should be considered to be made up of multiple practices that exist in concurrent states of differentiating dominance and emergence, a point which Brown & Duguid tentatively proffer themselves

the canonical organisation becomes a questionable unit of analysis from this perspective. And significantly, communities are emergent. That is to say their shape and membership emerges in the process of activity, as opposed to being created to carry out a task. (p.49)

Viewing an organisation as a collection of communities with multiple practices, as opposed to a single organisational entity and culture, provides the necessary conditions of variability that signals the potential for that organisation to be flexible, adaptive and highly innovative. Learning processes within an organisation are governed by the way information and knowledge is both created and distributed amongst these communities and the structures that support that process. As Brown & Duguid state, to understand the way knowledge is constructed and travels within an organisation, 'it is first necessary to understand the different communities that are formed within it and the distribution of power among them' (p.55). In this respect, ANT is better equipped for analysing the interfaces between the social and the material, the changing network of practices and the relations of power that secrete each conflict and exchange. As an analytical tool it can provide the basis for articulating how an organisation can, through analysing the interactions of both its material and semiotic elements, extract the latent innovative potential embedded within its communities, environments and the practices that hold them together.

## **Conclusion and Scope for Further Research**

In this paper we have attempted to demonstrate that the processes of learning and innovation form a symbiotic relationship of codependence, and that within organisations they are developed through both communities, practices and networks. Specifically, we have explored COPT and ANT as distinct, yet complementary methods for analysing and identifying learning and innovative practices and the conditions for their emergence. We have also tried to demonstrate that emergent communities of practices harbour the diverse potential for both creating new knowledge and new forms of innovation within organisational settings.

To extend learning and innovation within organisations we require a greater understanding of how communities of practices both emerge and construct knowledge through their shared social activity and practice. We also need to examine the broader structural environments in which these communities emerge and co-exist, as the inherent variation embedded with such communities provides a rich vein of potential for developing new learning practices and innovative strategies. The application of the methods we have described to specific, local environments could begin to provide new details or sketch new diagrams of how organisations can be structurally reorganised to extrapolate this latent potential in the process of creating long-term value for their stakeholders, partners, customers and end users.

We propose a series of empirical studies and seminars (using our SPACE framework) to analyse working practices within organisations to identify emergent communities of practice and the unique possibilities that can be created by them. If you are interested in exploring any of these possibilities please contact us, we will be more than happy to discuss practical opportunities with you.

## References

- Brown, J.S. and Duguid, P. (1991) 'Organizational learning and communities of practice: toward a unified view of working, learning and innovation', *Organization Science*, 2, 1: 40–57.
- Edwards, R. (2005) Learning in Context – within across domains, Seminar One, Contexts, Communities, Networks: Mobilising learners' resources and relationships in different domains, February, 2005, Glasgow Caledonian University.
- Fox, S. (2000) 'Communities of practice, Foucault and Actor-Network Theory.' *Journal of Management Studies*, 37, 6: 853-67.
- Fox, S. (2005) Actor-Network Theory: Implications for Networked Learning and Education, Seminar Three, Contexts, Communities, Networks: Mobilising learners' resources and relationships in different domains, October 2005, The Open University.
- Lave, J. (1993) 'The practice of learning'. In Chaiklin, S. and Lave, J. (Eds), *Understanding Practice: Perspectives on Activity and Context*, Cambridge University Press.
- Lave, J. and Wenger, E. (1991) *Situated Learning: Legitimate Peripheral Participation*, Cambridge University Press.
- Law, John (2008) 'Actor-network theory and material semiotics'. In Turner, Bryan S. (Eds), *The New Blackwell Companion to Social Theory*, 3rd Edition. Oxford: Blackwell: 141–158.
- Wenger, E. (1998) *Communities of Practice: Learning, Meaning and Identity*, Cambridge University Press.



This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/).