

Communities of Practice and Networks: Notes on the Key Concepts and Issues

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Introduction

This note attempts to clarify the contributions and limitations of the 'community of practice' (COP) perspective to our understanding of learning and innovation. It suggests that the COP perspective and network theory of inter-organisational collaboration can be integrated to make a stronger theoretical contribution. The paper also looks at the role of COPs in boundary-spanning learning. It develops the concept of an 'extended internal labour market' (EILM) as one particular form of institutional mechanism for building COPs in boundary-spanning learning.

The following 4 sections discuss the different aspects of the COP and network perspectives.

1. The Community of Practice Perspective to Learning and Innovation

A community of practice (COP), in brief, can be defined as 'a sustained, cohesive group of people with a common purpose, identity for members, and a common environment using shared knowledge, language, interactions, protocols, beliefs, and other factors not found in job descriptions, project documentation or business processes' (Miller 1995). The original concept of community of practice, as developed in the work of Lave and Wenger (1991), Wenger (1998) and Brown and Duguid (1991), is essentially a specific version of social learning theory. It draws our attention to a number of important features of learning and innovation much neglected in traditional formal learning theories and the economic literature.

Integration of learning and working

The COP perspective rejects the transfer model of learning and develops a view of learning as social construction, putting knowledge back into contexts in which it has meaning. It also suggests the elimination of a hierarchical distinction between abstract and practical knowledge.

The social and situated dimension of learning

Lave and Wenger's (1991) concept of *legitimate peripheral participation* argues that learning is about becoming an 'insider' or 'practitioner'. Learners are acquiring not explicit, formal 'expert knowledge', but embodied ability to behave as community members. In other words, learning is about 'doing' and 'interacting'. This is rooted in the epistemological view that a large part of human knowledge is tacit, action-oriented and

has a personal quality that makes it difficult to formalise or communicate (Polanyi 1962). Unlike explicit knowledge which can be formulated, abstracted and transferred across time and space independently of the knowing subjects, the transfer of tacit knowledge requires close interaction and the build up of shared understanding and trust among them. Hence the importance of becoming a member of the community.

Communities are emergent, fluid and important sources of innovation

It is also argued that through their constant adaptation and changing membership, evolving communities of practice can be important sites of innovation. Brown and Duguid (1991), in linking the idea of community of practice with organisational learning and innovation, argue that large organisations, if effectively structured as communities-of-communities, have the potential to be highly innovative and adaptive. The authors also mention that emergent communities of practice that span the boundaries of an organisation would provide a channel for external and innovative views to flow into an organisation. It is also suggested that the design of organisational architecture and the ways communities are linked to each other are important means for harnessing innovative energy.

2. Communities of Practice, Networks and Inter-Organisational Collaboration

I argue here that the COP perspective, although giving important insights into the social process of learning within organisations, has limitations in the way it explains the relationship between organisational learning and innovation, and the emergence of organisational architecture in inter-organisational collaboration and networks. The integration of the COP perspective with the network theory of inter-organisational collaboration can potentially make a stronger theoretical contribution to our understanding of learning and innovation. A fuller development of the COP perspective into a theory of organisational learning will need to address the following issues.

The boundary of COPs: different types of communities of practice underpinning different forms of learning and innovation

The notion of community of practice is grounded in the concept of 'ba' proposed by Nonaka and Kono (1998). A 'ba' is a shared social space for emerging relationships that serves as a foundation for knowledge creation. It has a cognitive and a structural dimension. Participating in 'ba' means transcending beyond one's limited cognitive perspective or social boundary to engage in a dynamic process of knowledge sharing and creation. The scope of the 'ba' defines the boundary and variety of learning within the community of practice, and thus its capacity for generating different types of innovation. In my earlier papers (Lam 2000; 2002), I propose two alternative models of learning and innovation, namely, the 'organisational community' vs. 'occupational community' models. Both models share an important common feature: the role of tacit knowledge in

generating learning and innovation within 'communities of practice'. However, the boundary and nature of the 'ba' differs, and thus leading to significant contrasts in their learning and innovation patterns.

The occupational community model operates within an open and fluid occupational-based labour market which permits hiring and firing and the development of human resources within broader boundaries and varied contexts. It fosters the development of a highly flexible and adaptive form of organisation: the 'operating adhocracy'. This type of organisation has a permeable boundary that allows the radical insertion of ideas from the external environment. This occurs through open recruitment of people, and the extensive professional networks of the organisational members which transcends organisational, institutional and also societal boundaries. The scope of the 'ba' can be very wide and fluid. The occupational community model of learning encourages experimentation and entrepreneurial behaviour and has the potential to achieve radical innovation. Some of the world's most innovative and prosperous high-technology clusters are rooted within an occupational-based communities of practice. California's Silicon Valley is a good illustrative example. The region is characterised by an extremely mobile and open labour market. The region has an unusually high rate of labour turnover. One explanation is that the engineers and scientists in the region develop their commitment and loyalty to each other and to the 'craft of innovation' through shared professional experiences. Their sense of community lies in the occupation, and not in any particular organisation. Such social and professional networks not only provide important channels for dissemination of information and learning. They also serve as highly efficient job search networks. An important consequence of the extremely high rate of mobility is the rapid diffusion of technological capabilities and know-how.

In contrast, the 'organisational community' of learning derives its strength from the cultivation of firm-specific core competence. It enables the accumulation of tacit knowledge within the boundary of the firm, and the continuous combination and recombination of firm-specific product and process technology with industry technology. The 'ba' exists within the boundary of the firm, or networks of firms with close relational and historical ties. Firms within the organisational community may develop a strong orientation to pursuing an incremental innovation strategy and do well in established technological fields. The strong emphasis on 'competence preservation' within organisations, however, inhibits the creation of active labour markets, and thus making it difficult for firms to renew their knowledge base and compete successfully in rapidly developing new fields. Large firms in Japan exhibit some of the most quintessential features of the organisational community model of learning. The dominance of a firm-based human resource system and their emphasis on internal organisational proximity (i.e. organisations as communities-of-communities) gives rise to a strong capacity for generating, diffusing and accumulating tacit knowledge through 'learning-by-doing' and interaction. It is good at incremental and continuous innovation. However, learning in this type of organisation is also potentially conservative. The stable social structure and shared knowledge base rooted within the organisational community may block radical innovation.

Issues of power in learning and the development of new practices

The COP perspective has specific limitations in the way it deals with power issues in its analysis of the learning process (Fox 2000). Wenger's (1998) theoretical framework for analysing communities of practice sees learning as the negotiation of meaning and a process of identity formation. The issue of power is handled as an aspect of identity formation rather than practice per se. This poses a limit to our understanding of the emergence of new practices (learning), how they evolve into higher levels of social order (institutionalisation) and the dynamic relationships between 'contexts' and 'practices' (structure and action).

The sociology of knowledge sees power and knowledge as indissociable from one another. A sociological concept of knowledge has to take into consideration (Gernot 1997: 457):

- That for every type of knowledge there is a bearer;
- That knowledge types have a society-creating force for their bearers
- That knowledge types form hierarchies;
- That knowledge society creates dependencies between people;
- And, that certain competences and opportunities are linked with knowledge

The relationships between different kinds of knowledge are social relationships between the individuals and groups who develop and possess them. Thus, the process of creating new knowledge means creating new relationships or new ways to combine and manage the social relationships. The process involves a negotiation of new identity, roles and responsibilities which is inherently conflictual.

The manner in which power connects learning and practices can be most vividly observed in inter-organisational collaboration. Power is a central aspect of the dynamics of such collaboration (Nelson et al 2000). Inter-organisational collaboration involves negotiation of social order because of the lack of pre-defined institutional roles that accompany market- and authority-based relationships. Collaboration reproduces, translates and innovates new practices. This process, however, is contingent on the power relationships among the collaborating organisations. Powerful participants are able to define meanings and identities more forcefully than others and establish new practices that will privilege their own position and capabilities. While communities of practice are emergent, it does not occur in a vacuum. It draws on the norms and resources of the organisations of the existing participants; on-going activities within the communities of practice reproduce, innovate and transform the practices and resources within and between organisations.

The study of inter-organisational collaboration and network relationships provides a theoretical bridge between the 'emergent' community of practice (action) and the process of structuration. Power is an important concept connecting the two.

Is learning within COPs self-perpetuating? How do COPs sustain themselves and how do they evolve?

How do COPs evolve into higher levels of social structure? How do we understand the links between micro- and macro-actors?

3. The role of COPs in boundary-spanning learning: possibilities and limitations

A COP, taken as a governance form situated between hierarchy and networks, may provide an effective mechanism for boundary-spanning learning. The notion of boundary-spanning learning is broader than inter-organisational learning; it denotes learning across different functional and disciplinary arenas that are widely distributed across different organisational units and sectors. It is the most difficult and radical form of learning because of its cognitive and organisational complexity. Boundary-spanning learning is critical for radical and transformative innovation. With the increasingly complex growth of scientific and technological knowledge and the trends towards organisations becoming more specialised, building connectivity across different scientific arenas and organisational boundaries becomes a critical avenue for learning and innovation.

The COP approach, by focusing on 'communities' and 'practices', offers opportunities for re-negotiation of competences through a context of co-participation and joint problem solving. It has the potential for generating radical learning leading to the development of new competences. The boundaries of communities are usually less well defined than an organisational unit; it is emergent and fluid, and thus can be re-defined in the context of emerging problems and on-going activities. In other words, the context of shared experiences and joint problem solving may lead to the emergence of new COPs. According to Wenger (2000), COPs are the basic building blocks of a social learning system because they are the social 'containers' of the competences that make up such a system. COPs grow out of a convergent interplay of competences and shared experiences. As a result, they are important social units of learning and for the development new competences.

Boundaries are important for learning because they connect communities and they also offer opportunities for learning in their own right (Wenger 2000). At the boundaries, competence and experience (practice) tend to diverge. The divergence and tension between competence and experience constitutes an important source of learning and innovation. An important question to raise here is how and at what stage boundary-spanning learning leads to the re-configuration of core practices and the emergence of new COPs? Do those engaged in boundary-spanning roles remain as 'brokers' bridging the different COPs', or do they eventually become 'practitioners' in their own right?

At the heart of the COP theory is the idea that social identity is important for learning: learning is about *becoming* a practitioner and not learning *about* practice. From this

perspective, boundary-spanning learning is potentially difficult because it requires the realignment of the individual's identity with that of the emerging COP. One of the most important forms of identities in modern society is bound up with employment relationships. Many of the COPs referred to in the literature are organisational- or occupational-based. These COPs are rooted in the members' social identities and careers. The emergence of new COPs across boundaries requires the formation of new identities. What would be the basis of the new identities? Does boundary-spanning learning also require the formation of boundary-spanning careers?

We need to develop a better understanding of the links between COPs and careers, a missing dimension in the debate about COPs, networks and learning.

4. The concept of an 'extended internal labour market' in boundary-spanning learning: building university-industry COPs

In my own research on how firms and universities have managed boundary-spanning learning activities between the two kinds of institutions, I have found that they have used what can be called 'extended internal labour markets' (EILMs) (Lam 2001). These are set up where there is no pre-existing COPs and when the firms and universities are keen to set up an infrastructure in which they might develop.

In the knowledge-intensive sectors, firms have to deal with two major problems of knowledge generation and transfer. The first is the speed of knowledge advancement and the limits of codification for effective knowledge transfer. At the upper end of the skill spectrum, knowledge is now moving too rapidly to be encoded and institutionalised into a stable set of occupations. Traditional institutional signals (e.g. occupational qualifications) have severe limits in providing dependable information about the quality and contents of skills that individuals have. A second related problem stems from the growing importance of Mode 2 of knowledge in the new innovation context (Gibbons et al 1994). Unlike Mode 1 knowledge which is disciplinary-based and accumulated through academic specialisation, Mode 2 knowledge is created and reconfigured in the context of application involving multiple actors, and generated through interaction between 'theory' and 'practice'.

An important response adopted by many firms is to develop a more focused and targeted approach to the ways that they relate to academic institutions in order to gain early access to scientific human resources, and to participate in the process of knowledge production. The idea is to focus their attention and concentrate resources on a small number of key institutions from where they are most likely to resource their people and knowledge. The term 'strategic partnership' is often used to denote an intention to forge long-term, multi-dimensional and trusting relationships with the 'preferred institutions'. The relationships between the companies and academic institutions are sustained by a range of linking mechanisms including collaboration in research, industrial inputs to curriculum development, student placements, and exchange of staff. By becoming a trusted partner in the academic community, companies are not only in a better position to catch the best

students early but also have an opportunity to influence the education and training of their future researchers. Another significant strategy adopted by some of the companies is the creation of 'hybrid research organisations' sitting on the interface between the companies and universities to forge close institutional links. The companies would usually provide initial funding for the setting up of the organisations and be closely involved in the recruitment of key research staff. Although the research staff are formally employed by the universities, in practice, they are 'joint human capital' shared between the universities and companies.

The concept of an 'extended internal labour market' (EILM) would seem useful to interpret the significance of the new approach adopted by the firms. This concept, in a traditional sense, is used to describe the recruitment channels most commonly used by firms for non-skilled manual workers (Manwaring 1984). It refers to the practice of recruiting through existing employees of the firm and extending its internal labour market through their social networks in the local community. It therefore describes a recruitment channel and the relationship between a firm and its community. Here, I apply the concept in a new context, stressing the active role of firms in developing an overlapping social infrastructure between two different kinds of institutions for the co-production of knowledge and human resources. Unlike earlier work which has focused primarily on recruitment channels, I highlight the importance of EILMs, in addition, as mechanisms for knowledge and skills generation and transmission between universities and firms in the high-skills sector. EILMs create permeable boundaries between firms and universities to allow a two-way flow of knowledge and people, and the rapid transfer of codified and tacit knowledge. The EILM concept draws attention to the critical role of mobility of people and the development of a 'context of co-participation' in the formation and transmission of knowledge in the high-skills sector.

The building up of strong social networks through EILMs serves three important functions: a) as a recruitment channel; b) as an emerging COP and informal apprenticeship system; and c) as a mechanism for sustaining boundary-spanning knowledge networks.

EILM as a recruitment channel

In areas where knowledge is advancing too rapidly to be easily identified and codified into specific occupations, social networks in EILMs provide more reliable information than formal certification about the type and quality of skills and knowledge that individuals have. As the competitive advantage of firms increasingly depends on nonreplicable human resources, the assessment of quality becomes critical (Zucker 1991). Social networks enhance the richness and quality of information transmitted. They serve as sources of reliable information. As noted by Powell (1990: 304): 'Networks are particularly apt for circumstances in which there is a need for efficient, reliable information... You trust information that comes from someone you know well'. EILMs thus allow firms to have an established channel and trusted information sources to recruit a core of stable and reliable knowledge workers.

EILM as an emerging COP and informal 'apprenticeship' system

EILMs also serve as interfacing mechanisms through which industrial practice penetrates formal academic training. They facilitate an interactive two-way flow of knowledge between university and industry. The traditional professional model assumes a sequential, one-way flow of knowledge: universities give the theoretical training, and work in firms provides practical experience. In contrast, the EILM approach allows a two-way interaction between 'theory' and practice and creates opportunities (e.g. student placement) for 'learning in context', and for instilling the social and organisational skills specific to firms that employed them. This could remedy the shortcomings of specialist academic education and enhance the relevance of the knowledge and skills acquired. From the viewpoint of academic institutions, the EILM amounts to an 'extended academic community' with much movement of people between academia and workplace, as students, instructors and research collaborators. Such a community could provide a more effective forum for Mode 2 knowledge production. It has the potential to generate a new institutional infrastructure governing the education and training of high-skill personnel.

EILM as a boundary-spanning knowledge network

With the growing pace of knowledge generation and the diversity of expertise and disciplines required for innovation, firms increasingly need to enlarge the space for the search of knowledge and skilled personnel. EILMs serve to create and sustain firms' external knowledge networks. They enhance the permeability of firms' boundaries, allowing them to gain access to external knowledge resources and expertise without the commitment of full internal integration. The formation of EILMs for forging close links with universities is especially important for sustaining firms' ability to generate new knowledge. Unlike professional networks which are highly particularistic and bounded within specialist disciplines or occupations, the university represents a much more open and fluid knowledge network node. Moreover, universities offer stable career structures for members of the 'extended core'. By gaining access to the university through EILMs, firms are able to tap into the wider knowledge networks of individual academics. It broadens their boundary of knowledge exploration and potential for innovation. The co-production of human resources through informal apprenticeship also facilitates rapid and direct integration of evolving new knowledge into the routines of firms.

In recent years, the nature of interaction between academia and industry has shifted from the 'linear model' of knowledge transfer to an 'interactive model' emphasising the creation of overlapping institutional spheres, networks and hybrid organisations at the interface. (see 'Triple Helix' argument, see Etzkowitz and Leysdesdorff (2000)). Little detailed empirical work has been done to examine the development and operation of the overlapping spheres and hybrid organisations. The example presented above suggests that the COP perspective, together with the network theory of inter-organisational collaboration might provide a useful approach to understand how these overlapping institutional structures emerged and the dynamics of boundary-spanning learning.

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