The Need for Network Learning in Organizations: Demystifying Organizational Learning in the Digital Age

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Abstract

As the literature suggests, there is little evidence that helps to inform education, practice, policy, and research about issues surrounding the integration of collaboration tools within the context of OL (organisational learning). This conceptual paper tries to illuminate the important factors related to the adoption of collaboration technologies for OL. As technology is often the most visible part of OL—since it represents the tools that human beings use to do activities—there is a need to focus not only on the individual elements, but in particular on their mutual interplay. The paper concludes that in the digital age, organizations should provide collaboration tools so that individuals can a capacity to deal with complex and ambiguous phenomena in complex environments. The analysis in this paper provides a metatheoretical framework for understanding the nature of OL and judging OL based on learning traditions. Organisations will require each of these characteristics to varying degrees according to the circumstances.

One of the main groups of literature within the field of social learning is the group of classic works that predate the identification of the ideas of organizational learning (OL) (Easterby-Smith & Lyles, 2003; Easterby-Smith et al., 2000). Although there have been many contributions to the field, two authors had a significant influence before the earliest mention of the term: First, Dewey’s (2004) ideas of learning from experience fit most easily into models of individual learning within communities. His view about social learning in which learning takes place through social interaction, yet cannot be passed from person to person as if it were a physical object is essential. Second, Polanyi’s (1967) key idea of tacit knowledge has parallels to Dewey’s experiential learning. Within the field of social learning, tacit knowledge refers to the unexpressed knowledge of groups that provide the unique competencies which cannot be easily replicated (Easterby-Smith & Lyles, 2003).

Other definitions of OL mentioned frequently through the literature are (See Table 1.1):
### Table 1.  
**Main OL Definitions in the Literature**

<table>
<thead>
<tr>
<th>Authors</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Argyris &amp; Schön (1978)</td>
<td>OL is a process of detecting and correcting errors.</td>
</tr>
<tr>
<td>Daft &amp; Weick (1966)</td>
<td>OL is knowledge about the interrelationships between the organization’s action and the environment.</td>
</tr>
<tr>
<td>Fiol &amp; Lyles (1985)</td>
<td>OL means the process of improving actions through better knowledge and understanding.</td>
</tr>
<tr>
<td>Huber (1991)</td>
<td>An entity learns if through its processing of information the range of its potential behaviours is changed.</td>
</tr>
<tr>
<td>Lee et al. (1992)</td>
<td>The OL process is viewed as a cyclical one in which individual’s actions lead to organizational interactions with the environment. Environmental responses are interpreted by individuals who learn by updating their beliefs about cause-effect relationships.</td>
</tr>
<tr>
<td>Levinthal &amp; March (1993)</td>
<td>OL copes with the problem of balancing the competing goals of developing new knowledge (exploration) and exploiting current competencies (exploitation) in the face of dynamic tendencies to emphasize one or another.</td>
</tr>
<tr>
<td>Day (1994)</td>
<td>OL is comprised of the following processes: open-minded inquiry, informed interpretations, and accessible memory.</td>
</tr>
<tr>
<td>Crossan et al. (1999)</td>
<td>Learning is a process of change in cognition and behavior, and it does not necessarily follow that these changes will directly enhance performance.</td>
</tr>
<tr>
<td>Schwandt &amp; Marquardt (2000)</td>
<td>OL represents a complex interrelationship between people, their actions, symbols, and processes within the organization.</td>
</tr>
<tr>
<td>Sanchez (2001)</td>
<td>OL aims to generate, disseminate, and apply knowledge in an organization. It consists of five learning cycles: (1) individual, (2) individual/group, (3) group, (4) group/organizational, (5) organizational.</td>
</tr>
</tbody>
</table>
Theories of OL

The OL literature extends the discussion to develop theories to show that both behaviour change and cognitive change are necessary in the definition of learning. Theories of OL differ based on whether a cognitive or behavioural perspective of learning is adopted (See Table 2.1).

Table 2.
Influential Theorists in the Field of OL

<table>
<thead>
<tr>
<th>Author</th>
<th>Summary of Ideas</th>
<th>Perspective</th>
</tr>
</thead>
<tbody>
<tr>
<td>Garvin (1993)</td>
<td>Organizations learn and OL can be measured with an audit of both behavioural and cognitive changes and performance. Without changes in behaviour only the potential for improvement exists.</td>
<td>Behavioral development Cognitive development</td>
</tr>
<tr>
<td>Huber (1991)</td>
<td>An information processing perspective can be applied at individual, group, organizational or society levels of analysis. An entity learns if through the processing of information the range of potential behaviours is changed.</td>
<td>Behavioral development Cognitive development</td>
</tr>
<tr>
<td>Senge (1992)</td>
<td>Focus is heavily individual. Leaders are responsible for building organizations where people are continually expanding their capabilities to shape the future. There is a strong cognitive element in the creation of shared vision and the surfacing of mental models.</td>
<td>Behavioral development Cognitive development</td>
</tr>
<tr>
<td>Stata (1989)</td>
<td>The cognitive element in OL is shared beliefs, mental maps; learning results in innovation and behavioural change.</td>
<td>Cognitive development</td>
</tr>
<tr>
<td>Levitt &amp; March (1988)</td>
<td>Organizations learn by encoding inferences from history into routines that guide behaviour. Routines include forms, rules, procedures, strategies and technologies. There might be competency traps and erroneous inferences.</td>
<td>Cognitive development</td>
</tr>
<tr>
<td>Fiol &amp; Lyles (1985)</td>
<td>Learning (cognition) is distinguished from adaptation</td>
<td>Cognitive development</td>
</tr>
<tr>
<td>Authors</td>
<td>Description</td>
<td>Category</td>
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<tr>
<td>Daft &amp; Weick (1966)</td>
<td>Individuals carry out the interpretation process which is necessary for the formulation of responses to problems. Organizations preserve knowledge, mental maps and norms over time by information sharing. There is a heavy cognitive element to the various modes of interpretation.</td>
<td>Behavioral development</td>
</tr>
<tr>
<td>Shrivastava (1983)</td>
<td>OL is an organizational process rather than an individual process. It is more behaviourally oriented in that organizations learn from experience, adapt their goals and search for solutions to problems.</td>
<td>Behavioral development Cognition development</td>
</tr>
<tr>
<td>Duncan &amp; Weiss (1979)</td>
<td>OL is concerned with the growth of organizational knowledge to improve action and outcomes; the emphasis is on behaviour and action.</td>
<td>Cognitive development</td>
</tr>
<tr>
<td>Argyris &amp; Schon (1996; 1977)</td>
<td>Organizations learn through individuals acting as agents for them. Learning is error detection (cognition) and correction (behaviour). Single loop learning is learning within a frame of reference; double loop learning is learning a new frame of reference.</td>
<td>Lower-level cognition Higher-level cognition</td>
</tr>
<tr>
<td>March &amp; Olsen (1975)</td>
<td>Organizations and their members learn from experience. Focus is on the organizational participant as problem-solver. Learning is acting, observing, making inferences and drawing implications. Organizations can learn from experience.</td>
<td>Cognitive development</td>
</tr>
<tr>
<td>Cangelosi &amp; Dill (1965)</td>
<td>OL must be viewed as a series of interactions between adaptation at the individual and adaptation at the organizational level. Learning is adaptation or a change in behaviour that demonstrate that an organization had learned.</td>
<td>Behavioral development Cognitive development</td>
</tr>
</tbody>
</table>

These classifications are presented as a provocative guide to analysis and not as a rigid model of development. “As Barley & Kunda (2001) noted noted, “ideal types are useful not because they are descriptively accurate- actual instances rarely evince all of the attributes of an ideal type- but because they serve as models that assist in thinking about social phenomena. As Spender (1996) argues, a view of the organisation as a dynamic system of processes involving several different types of knowledge should be taken into account if we are to make sense of OL. So, mapping models based on individual psychology (or individual learning practice) onto the organisation, may be wholly inappropriate. Spender (1996) goes on to argue that a richer epistemological approach, in which the various types of organizational knowledge and practice are considered both separately and in their interaction, could lead us towards more comprehensive and inclusive models. Following Wittgenstein he claims that the meaning of all knowledge is tied up with the context of its development and use (Spender, 1996). A paradigm shift away from positivist epistemologies to those which focus directly on the social nature of meaning and practice can lead to the reconceptualization of the organisation itself as a community of practice, with institutional dimensions that give these practices meaning (Spender, 1996).

**Social Learning Theories of OL**

Recent epistemological and psychological theories have moved focus away from the individual to the social and constructive nature of knowledge. In contrast to the acquisition perspective which considers the mind as being a container, knowledge as a substance and learning as the transfer and addition of substance to mind, the participation perspective derives from studies of learning which understands learning as participation in communities of practice (Lave & Wenger, 1991). Accordingly, knowledge is socially constructed through collaborative efforts in dialogic interaction (Salamon, 1997). Cognition is also based on distributed access to information and a shared understanding amongst participants (Hutchins, 1995). The OL implications of this epistemology are profound. First, learning is situated, contextual and closely tied to the situation in which knowledge is being created (Brown et al., 1989; Lave & Wenger, 1991). Legitimate peripheral participation occurs through the attainment of the subjective perspective of individuals engaged in a shared enterprise that is contained within artifacts, behaviour and language (Lave & Wenger, 1991). Learning is more about becoming a practitioner through social interaction with others than learning about the practice (Brown & Duguid, 1991). Newcomers are moved to the status of full practitioners through a social process of scaffolding by experienced practitioners, shrinking the zone of proximal development to enable the novice to become a contributing member of the community (Brown & Duguid, 1991).
The concept of Communities of Practice (CoP) could be operationalized as an empirical construct to provide a useful framework from the social learning perspective (Novicevic et al., 2007). Lave and Wenger are credited with coining the term CoP in their 1991 book, *Situated Learning: Legitimate Peripheral Participation*, in which they examined how “master practitioners” and “newcomers” form apprenticeship relationships through which situated learning takes place. To Lave & Wenger (1991), learning is a process that takes place in a participation framework, not in an individual mind. This means, among other things, that it is mediated by the differences of perspective among the CoP participants. It is the community, or at least those participating in the learning context, who ‘learn’ under this definition. (Lave & Wenger, 1991, p.15). Thus, the notion of CoP was first used, “to describe the way in which meaning was negotiated and reflected on in the practices of specific occupational groups . . .” (Wesley & Buysse, 2001, p.7). CoP’s are ‘groups of people who share a concern, a set of problems, or a passion about a topic, and who deepen their knowledge and expertise in this area by interacting on an ongoing basis.’ They operate as ‘social learning systems’ where practitioners connect to solve problems, share ideas, set standards, build tools, and develop relationships with peer and stakeholders . . . [They] feature peer-to-peer collaborative activities to build member skills and steward the knowledge assets of organizations and society (Wenger & Snyder, 2000).

CoP’s can also be understood as spaces through which “communicative action” can take place (Polanyi, 2002). They are mediated by and through the social construction of knowledge (Wenger, 2004). CoP’s are said to exist at the intersection of intellectual and social capital—through which social networks serve as the basis of knowledge creation and transfer (Kent et al., 2009; Lesser & Prusak, 2000; Wenger, 2004; Wenger & Snyder, 2000). It is believed, “that communities of practice are valuable to organizations because they contribute to the development of social capital, which in turn is a necessary condition for knowledge creation, sharing, and use” (Lesser & Prusak, 2000, p. 124).

CoP framework has come to be applied to both “intra” or “inter” organizational settings, described as “existing everywhere” as an “an integral part of our daily lives” (Wenger, 1998, p. 6,7). Wenger has taken the concept of CoP and extended it into a comprehensive theory of how organizations and individuals within organizations work together (1998). In his book, *Communities of Practice: Learning, Meaning, and Identity*, Wenger describes organizations as essentially “constellations of communities of practice”, and asserts that CoP can transcend organizational boundaries and/or exist within and across formal networks (1998, p. 30). CoP are also widely referenced in the literature to analyze strategic alliances and cross-sector collaborations (Toby, 2000; Lathlean & le May, 2002; Dewhurst & Navarro, 2004). These studies suggest that inter-organizational networks and collaborations are fertile ground for the application of CoP theory.

The second feature of a CoP is the matter of engaging in a “joint enterprise,” which Wenger and his associates describe as the realm of purpose and “domain”—referring to its common purpose and the sense of members’ identification with a topic or practice (Snyder et al., 2003). “Communities of practice are groups formed around a shared interest in which discussion builds on the values and motivations of their members” (O’Donnell et al., 2003, p. 83). These interests and the common purposes that are derived from them are “communally” negotiated (Wenger, 1998, p. 78). “Practice is, first and foremost, a process by which we can experience the world and our engagement within it as meaningful” (1998, p. 51). A CoP’s joint enterprises are said to be held together through “mutual accountability” (1998, p. 81), essentially the level of reciprocity that exists between and among members of a CoP.
Wenger’s third feature of a CoP is the existence of a “shared repertoire,” (1998, p. 82) that can be understood as the realm of tools and techniques (Wenger & Snyder, 2000). The shared tools and techniques of a CoP are the medium through which meaning is negotiated and learning occurs. A shared repertoire can include informal conversation around a lunch table to a structured protocol to guide dialogue and decision-making. Wenger & Synder (2000) also state that CoP are no longer the new frontier of organizations and have become as common as business units or teams; these informal structures require specific efforts to be integrated into the organization so that their full power can be leveraged (Wenger & Snyder, 2000; Dean & Peter, 2000).

When it comes to applying the CoP framework to organizational settings, consideration should be given to the modes of communication used within and between CoPs. These modes of communication include face-to-face interactions as well as the use of various information technologies. The literature regarding the place of “virtual communities of practice” most often looks at the role of information technology within the context of the existence of on-line CoP (Davenport & Hall 2002; Daniel et al., 2002; Henri & Pudelko, 2003). These studies point to the importance that the CoP framework has taken on as a tool to assess the quality of on-line communities and the role that information technology (both from a hardware and a software perspective) has in the process. Whether it is through face-to-face interactions or via electronic forums, CoP members will engage in some form of dialogue with each other. Studies have been conducted examining the quality of “virtual discourse”, the role of storytelling and narrative development, the adoption of common language and assessment of the quality of dialogue (Gajda & Koliba, 2007). These studies confirm the important role that the quality of dialogue plays in the cultivation of effective communities of practice. CoP dialogue has been measured in terms of frequency, degrees of structure and quality of exchanges, and aligned to systemic evaluation of data and decision-making (Gajda & Koliba, 2007).

The Need for Network Learning in OL

Based on these related theories and definitions of OL, OL can be defined as the process of communication, collaboration and connectedness. For this to occur, there must be a system of individuals, technology and organisational elements and the interactions of these elements:

(1) Individuals are the most obvious part of OL: if there are no individuals within the organisation, then nothing will happen. Therefore, human beings are the focal point of OL.

(2) Technology is often the most visible part of OL, since it represents the tools that human beings use to do activities. Technology refers to physical systems or tools - machinery, tools, equipment, software programs, databases, and so on.

(3) Organisation refers to the formal managerial systems under which individuals function. For instance, communication channels, hierarchy of responsibilities and tasks, and other formal organisation manifestations will greatly influence individuals and their actions.

This points to the need to focus not only on the individual elements, but in particular on their mutual interplay. The definition proposed above emphasizes the formal and informal way in which human beings interact as an essential constituent of OL.
These characteristics inherent in organisations is also aligned with Siemens’ statements about learning in networks. This approach to learning has been captured under the heading of ‘connectivism’. In his paper of the same name, Siemens (2004) articulates the major theses: Learning and knowledge rests in diversity of opinions. Learning is a process of connecting specialized nodes or information sources. Learning may reside in non-human appliances. Capacity to know more is more critical than what is currently known. Nurturing and maintaining connections is needed to facilitate continual learning. Ability to see connections between fields, ideas, and concepts is a core skill. Currency (accurate, up-to-date knowledge) is the intent of all connectivist learning activities. Decision-making is in itself a learning process. Choosing what to learn and the meaning of incoming information is seen through the lens of a shifting reality which might ultimately lead to the cultivation of OL.

As Siemens (2004) argues, in any network, there will be three major elements:

– Entities, that is, the things that are connected that send and receive signals
– Connections, that is, the link or channel between entities (may be represented as physical or virtual)
– Signals, that is, the message sent between entities. It must be noted that meaning is not inherent in signal and must be interpreted by the receiver.

Given today’s learning networks such as online communities of practice or social networks, one of the most important challenges for organisations is to manage well in this context of shared knowledge. Thus, knowledge can be characterized as pluralist, socially constructed, fragmented and discontinuous and having an axiological dimension (Rooney & Schneider, 2005). Disappointingly, the OL literature makes little direct comment about knowledge despite the fact that learners constantly deal with high-level knowledge work of analysis, synthesis and deciding. This paper argues that the more needs to be said about online collaboration in OL as the capacity to handle knowledge is a crucial component of OL.

Network learning principles assume not only that there is significant knowledge in these networks, but more importantly that learners deal effectively with the shifting nature of knowledge.

Knowledge is not a unitary thing, but a complex network of facts, ideas, beliefs, memories and intuitions (Rooney & Schneider, 2005). Ideas need to be connected to other ideas to create meaning and to find answers to problems. So, organizational learning networks are not static as one’s state of knowledge is constantly changing. Given the central role of knowledge in learning networks – collective knowledge- and the complex nature of knowledge, it is crucial that knowledge is characterized in a community context that is relevant to OL.

Collective knowledge residing in the learning networks is pluralist (Spender, 1996). Knowledge systems are taken to be constructed of multiple and contradictory ideas, assumptions, beliefs, intuitions and memories that are taken by their possessors to have socially justifiable truth values (Rooney & Schneider, 2005). So, knowledge is taken to have truth values that are (re)constructed in social relations and especially through online communication. This is also consistent with the sociological view of knowledge that sees knowledge as an expression of culture, as symbolic rather than simple explanatory (Zander & Kogut, 1995). This symbolic perspective suggests that sophisticated communication is essential if knowledge is to be shared and diffused throughout a community (Zander & Kogut, 1995). So, a large part of OL is the steering and facilitating activities using collective symbols and communication.
OL networks can be considered as complex, autonomous self-organizing systems that emerge as the outcomes of the interaction of different types of knowing within a bound and deliberately created context (Spender, 1996; Tsoukas, 1996). Throughout the literature, such systems have also been referred to as socially distributed activity systems (Engestrom, 1991) and shared contextual spaces (Nonaka, Toyama, & Konno, 2000). So, knowledge is not formulated in relation to content, but, rather, as flows, relations, patterns, contexts and emergence in complex systems. For learners, the realization that knowledge is a background of complex processes should bring with it an understanding that knowledge work is a social challenge. Simon (1955, 1987, 1991) argues that we are boundedly rational and Berger & Luckmann (1966) argue that knowledge is subjectively constructed.

Given this description of OL networks, the essential elements of OL network semantics can be identified. First, context, that is, the localization of entities in an OL network (Siemens, 2004). Context is required in order to interpret signals, that is, each signal means something different depending on the perspective of the organization receiving it (Siemens, 2004). Second, salience, that is, the relevance or importance of a message (Siemens, 2004). This amounts to the similarity between one pattern of connectivity and another (Siemens, 2004). If a signal creates the activation of a set of connections that were previously activated, then this signal is salient. Meaning is created from context and messages via salience. Third, emergence, that is, the development of patterns in the organisational network. Emergence is a process of resonance or synchronicity, not creation. We do not create emergent phenomena. Rather emergence phenomena are more like commonalities in patterns of perception. It requires an interpretation to be recognized; this happens when a pattern becomes salient to a perceiver. Fourth, memory is the persistence of patterns of connectivity, and in particular, those patterns of connectivity that result from, and result in, salient signals or perceptions (Siemens, 2004).

This is not the definitive statement of OL, yet it is developed in the classic mold of network learning, through a process of immersion into the network and recognition of salient patterns (Siemens, 2004). What sort of network? The following list is typical of what might be called ‘organisational network’ practices online:

Practice: Content Authoring and Delivery
- Numerous content authoring systems on the web...
- Weblogs
- Content Management Systems
- Audio and Podcasting
- Digital imagery and video
- Collaborative authoring

Practice: Organize, Syndicate Sequence, Deliver
- Aggregation of content metadata
- Aggregators
- Aggregation services
- the Semantic Social Network

Practice: Chatting, Phoning, Conferencing
- Bulletin board systems and chat rooms, usually attached to the aforementioned content management systems
– Audioconferencing
– Videoconferencing

Conclusion

Derived from these statements, OL should be a laudable instantiation of these characteristics of network learning as specified above. In the digital age, organizations must have a capacity to deal with complex and ambiguous phenomena in complex environments. Secondly, OL should provide a capacity to seek out and understand the facts of a situation and to deal with them rationally, but also to understand and question the ontologic basis of these facts. Thirdly, OL should include a long-term vision and have a proven commitment to life-long learning. Finally, organizations should provide collaboration tools so that individuals can reach other people online.

It might be argued that these features of OL could have been devised without having to go through the theoretical process outlined in this paper. Yet, this analysis provided a meta-theoretical framework for understanding the nature of OL and judging OL based on learning traditions. Organisations will require each of these characteristics to varying degrees according to the circumstances.

References


