



# Conceptions of learning and managing the flow of knowledge in the project-based environment

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## Abstract

**Purpose** – The purpose of this paper is to examine how people can conceive learning and knowledge management processes within project teams and provides conceptual guidance on the most effective way to managerially approach these important and often neglected project issues.

**Design/methodology/approach** – This is a conceptual paper which draws on and dissects a very broad and relevant literature on learning and knowledge management.

**Findings** – Based on the analysis conducted, and with an eye to improving project learning, project outcomes and participant learning skills, the key argument of this paper is that participants in project teams must acknowledge and pursue a more socially oriented trajectory in their learning and knowledge management activities. Therein, the participants, their project practices and the organization of the project environment become the focal points of attention and action.

**Research limitations/implications** – This paper puts forward a conceptually grounded argument for a greater practical emphasis to be placed on the social systems in learning and knowledge management processes in projects. The opportunity exists to test this argument in further empirical project studies.

**Practical implications** – This paper provides a foundation for project practitioners to critically reflect on their current learning and knowledge management attitudes and practices, while encouraging their attention towards the management of their project social systems.

**Originality/value** – This paper confronts conventional and limited perspectives about learning and managing the flow of knowledge within projects, and serves to stimulate participant and researcher reflection on more socially oriented approaches towards these project activities.

**Keywords** Learning, Knowledge management, Social systems

**Paper type** Conceptual paper

## Introduction

As organizations confront global competition, restructuring and de-layering of management structures, changing economic and social values regarding knowledge and intellectual capital, and computerization and other high-technology infrastructures, they need to respond to those challenges in an adaptive and flexible way - which places a premium on learning to facilitate survival and growth (Hedberg, 1981; Schein, 1993; Leonard-Barton, 1995, 1992; Miner and Mezias, 1996; Tsang, 1997; Choo, 1998; Denton, 1998; Starkey, 1998; Kezsbom and Edward, 2001; Ingelgård *et al.*, 2002). The reliance on and development of intellectual capital to successfully engage with these dynamic environmental conditions, has meant that managers in any context need to foster learning rich organizational contexts (Boud and Garrick, 1999; Watkins and Cervero, 2000; Saint-Onge and Wallace, 2002). Underpinning the ability to initiate



and foster such learning rich conditions is a broadly developing realization of the need to understand how a person learns within specific contexts, so as to enable development of the individual as well as the development of satisfactory organizational outcomes (Bresnen *et al.*, 2003). Indeed, in the project-based environment for example, learning is actually a key strategic variable for project management (Ayas, 1996). Accompanying this developing interest in and appreciation for learning in organizations has been an emphasis on the development of knowledge management activities as a means to create organizational value and generate competitive advantage (Easterby-Smith *et al.*, 2000). In dynamic environmental conditions in particular, the generation of such competitive advantage may remain an elusive organizational goal, if either of the primal dimensions of knowledge management, i.e. the human and technical dimensions, are not clearly understood nor equally and appropriately addressed (Sense, 2007a, b).

It would seem important then to develop a deeper understanding of the ways in which people learn and can create and share knowledge within any context if one seeks to respond effectively to the challenges and opportunities of complex business and social operating environments. In particular, with projects and project teams playing key roles in knowledge creation in organizations (Nonaka and Konno, 1998), and with the increasing use of them to accomplish a diverse and often complex set of technological and cultural changes that would otherwise be less obtainable by the permanent organization (Lundin and Hartman, 2000; Antoni and Sense, 2001; Ayas and Zeniuk, 2001), there is a necessity to better understand these learning and knowledge management phenomena and their interaction within a project setting. This is particularly so, when one considers how learning and the management of knowledge within projects are the source of some conceptual contention or ignorance, which has impacts on both the intellectual contribution to a project's objectives and the development of the learning competency skills of project participants. Arguably then, an important and primal contribution to achieving this deeper understanding of these phenomena in project team settings, involves an examination of how we conceive them within projects. Such an examination may result in confrontation with biased or limited perspectives of these phenomena, and may consequently challenge how one approaches learning and knowledge management activities within projects.

This paper brings these important and fundamental conceptual issues to the fore, for reader assessment and critical reflection on their attitudes towards and their pragmatic efforts pursued in managing their learning and knowledge flows within projects. In so doing, it is also the intention of this paper to expose the reader to a fresh perspective on how they might best managerially engage with these phenomena within project settings. In accordance with that intention, the next section of this paper introduces and appraises the core conceptual frameworks concerning learning at an individual and team level. The following section then examines the conceptual frameworks relating to the management of knowledge flows. Based on the analysis undertaken, this paper argues, that participants in project teams should acknowledge and pursue a more socially oriented trajectory in their learning and knowledge management activities. In the final discussion section of this paper, the implications for research and practice resulting from the arguments presented are briefly appraised.

## Conceptions of learning

### *The cognitive dimension of learning*

Cognitive learning theory has emerged as the predominantly recognized and generally accepted individual learning theory. The pre-eminent cognitive theories evaluated in this section include, Kolb's (1984) experiential learning theory, Argyris and Schön's (1978) theory-of-action perspective, and Senge's (1990) five disciplines perspective. Underpinning these psychological or cognitive theories on learning is an assumption that conflict (caused by error or different information) is an essential condition for learning and acts as a motor driving the learning process (Dodgson, 1993). That is, variation occurs in experiences, which then prompts individuals into reflection on the events and adjustments to their perceptions and actions. This process is reflected in the works of Kolb (1984), Dewey (1938), Lewin (1946) and Piaget (1953), where they offer slightly different versions of a common experiential learning cycle, involving phases of having an experience, reflective observation, abstract conceptualisation and active experimentation (Sense, 2007b). Kolb (1984) actually synthesized the experiential work of John Dewey (higher education), Jean Piaget (cognitive development) and Kurt Lewin (organizational development), and consequently, formed a unique perspective on learning and development (Kolb *et al.*, 2002). In relation to presenting a valid and economical discussion on this literature field, and given Kolb's work is a synthesis of these three founding fathers of experiential learning theory, this paper will only specifically elaborate on Kolb's (1984) experiential learning cycle.

Dixon (1999, p. 41) sums up the essence of Kolb's experiential learning theory as, "learning is about interpreting what we experience in the world and that we each create our own unique interpretation and that interpretation mediates our actions." Kolb (1984, p. 38) simply describes experiential learning as, "the process whereby knowledge is created through the transformation of experience." Some authors have offered criticisms of Kolb's learning model surrounding its apparent ignorance of the sociological aspects impacting an individual's learning process, i.e. the human need to interact with each other and with their social and cultural environments to enhance the learning processes (Holman *et al.*, 1997; Miettinen, 2000). However, even with such significant limitations, Kolb's approach is the most widely used descriptive model for learning as a continuous process, and it highlights experience as a key component in the individual knowledge creation process (Sense, 2007b).

As well as being continuous and grounded in experience, Kolb (1984) also posits that learning requires the resolution of conflicts between dialectically opposed modes of adaptation to the world, e.g. the conflict between concrete and abstract concepts, and involves transactions between the person and the environment. As such, the experiential learning process is not strictly only a person centred psychological view of learning, but one indicating that individual behaviour is a function of both the person and the environment and a result of this reciprocal interpenetrating determination (Kolb, 1984; Beard and Wilson, 2002). These transactions between the person and the environment highlight the interdependency of the individual and the environment in affecting change, behaviour and learning processes (Sense, 2007b).

Another major contributor to this field of cognitive learning theory is the popular organizational learning (OL) theorist, Senge (1990). He stresses the need to take a systems approach to learning, and his focus is predominantly on individual cognition, where we "learn by using our brains and our ability to think in the abstract about the world"

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(Elkjaer, 2001, p. 155). Specifically, Senge (1990) attributes OL primarily to the personal learning attributes of organizational members - involving five disciplines. These consist of: systems thinking – where an individual views the world and its processes as an abstract integrated whole rather than a series of isolated parts; personal mastery – where a person becomes committed to their own lifelong learning and involves clarifying and deepening their own personal vision and focusing individual energies; building a shared vision - where a leader unveils shared pictures of the future held by individuals that will foster genuine commitment and engagement, and a common sense of identity; team learning - which involves the capacity of team members to suspend assumptions and enter into a genuine thinking together, and engaging in dialogue; mental models - which are the individual's deeply ingrained assumptions, viewpoints, and generalizations about the world which guide how we interpret that world and how we take action (Senge, 1990).

This theme of mental models and their influence on our interpretations and behaviours is also a predominant attribute in Argyris and Schön's (1978) theory-of-action perspective on OL. Argyris and Schön (1978) contend that sustained achievement of the values of OL is seen as depending on the engagement of double loop learning processes, wherein, defensive routines of the players are exposed and evaluated in workshop situations (Dunphy *et al.*, 1997). Argyris and Schön (1978) find that people are socially conditioned to use the cognitive model they refer to as Model I. That model is characterized by the need to control, maximize winning, suppress emotions and be rational. The consequences for people in that approach tend to be defensive behaviour, miscommunication and single loop learning. Alternatively, Argyris and Schön's (1978) Model II behaviour is based on directly observable data and requires that people support their advocacy of positions with illustration and with inquiry into other peoples' views – thus, increasing learning by publicly challenging existing frames or assumptions. Model II attempts to test and make explicit individuals' assumptions about the dynamics going on in their organizations.

Argyris and Schön's (1978) argument is that people should aim to move from a Model I position to a Model II position. Therein, they challenge existing theories and reject unilateral control, as compared to Model I and its governing variables of rationally defining goals and controlling the environment in pursuit of those goals. The consequence of pursuing the path to Model II, is that there would be an emphasis on double-loop learning, where individuals confront their basic assumptions behind their views of others and the world, and invite confrontation of their own assumptions and test these publicly (Argyris and Schön, 1978). In achieving this desired theory-of-action state, people and organizations will learn. Given this brief discussion on both Senge's (1990) and Argyris and Schön's (1978) perspectives, it is clear that they attribute OL primarily to the learning of the individual, mediated by individual personal attributes (Dunphy *et al.*, 1997). Underpinning the activation of these critically reflective individual processes are the context conditions. Therefore, establishing conditions that aid these reflective activities to proceed are also vitally important for the individual cognitive learning process (Senge, 2007b).

In sum, cognitive learning involves: having an experience, which we interpret and reflect on, from which we then develop abstract conceptualisations and action processes, which we later enact within the learning environment and create another learning experience; a continuous and individual cerebral process which is mediated by

individuals' personal cognitive attributes such as their mental models; being linked to social practice through individuals having experiences (including critical reflection experiences) within an environment. Therefore, in addition to an individual's personal cognitive attributes impacting learning, this social practice linkage highlights that multifarious social influences within an environment also mediate the cognitive learning processes of individuals. Therein, it implicates the importance of organizing the environment to assist the total knowledge creation process of individuals (Sense, 2007b).

*The situated dimension of learning*

This section discusses an alternative theoretical learning framework involving situated learning theory (SLT). In this perspective, learning is always considered a practical accomplishment that takes place amongst and through other people (where learners construct their meanings and understandings and learn through their social interactions within a context) and is not simply and only, an individual cognitive activity (where learners as individual actors possess and process information and modify their mental models) (Gherardi *et al.*, 1998; Richter, 1998; Gherardi and Nicolini, 2000).

Lave and Wenger (1991) see SLT simply as an analytical perspective on learning, or a way of understanding learning (Fox, 1997), which acknowledges that most learning occurs on the job in culturally embedded ways within a community of practice (Lave and Wenger, 1991). The main characteristic of SLT has been its discussion of the concept of context, in contrast to cognitive learning theory, which regards context as the container of impersonal, detached, asocial, apolitical and ahistorical de-contextualized knowledge (Gherardi, 2001). The primary focus of this theory of learning is on learning as social participation, which refers to a more encompassing process of being active participants in the practices of social communities (Wenger, 1998; Park, 1999; Senge and Scharmer, 2001). The significant themes of SLT include: knowledge and learning reside within a practice; the participation and interaction of people within a domain of practice; collective sensemaking (Weick, 1995) activities, and; the development of peoples' social and technical competencies and identities to function within the practice (Sense, 2007b). These notions of participation and interaction within a practice, the development of competencies to perform tasks within a workplace and the mutually determinant relationship of learning with the sociological aspects of contexts, are also reflected either explicitly or implicitly in the workplace vocational learning literature (Marsick, 1987; Marsick and Watkins, 1990; Garrick, 1998; Marsick and Watkins, 1999; Matthews and Candy, 1999; Solomon, 1999; Billett, 2000; Billett, 2001a, b; Järvinen and Poikela, 2001).

In helping us to understand learning (and in unison with the views expressed by Wenger (1998)), SLT therefore draws our attention to learning that takes place in everyday life, and within those contexts, the learning process is part of the activities and practices, and therefore, the social interactions of people within communities of people (Raelin, 1998; Fox, 2000; Billett, 2004). Knowledge resides in the social relations of the practice, and developing one's identity is part of becoming an insider in a community of practice (Gherardi, 2001). In an earlier work, Brown and Duguid (1991) also argued that learning, working and innovating were interrelated and complementary, and were neither conflicting or problematic forces – hence, they see

practice as essential to understanding work, knowledge being conjoined to practice, and learning being the connection between work and innovation. Practice connects knowing with doing and is highly improvisational, and is therefore considered a bricolage of material and mental, social and cultural resources, where people and the world are active bricoleurs, and therefore not docile or passive (Brown and Duguid, 1991; Gherardi, 2001). This perspective is also reflected in the following comment from Agashae and Bratton (2001, p. 92):

In the real world, competency and knowledge is acquired in the swampy lowlands of messy and ill-defined problems found in the indeterminate zones of practice. Through the concepts of knowing in action (tacit knowledge) and reflection in action (rethinking tacit knowledge) the individual develops competency (Garrison, 1991, p. 295).

Hence, learning as a practical activity, is always socially structured where the conditions and forms for learning are established unintentionally and tacitly by the community that shapes the practice – which makes learning evasive to many forms of planning (Gherardi *et al.*, 1998). In more specific and quite pragmatic terms, McLellan (1996) summarizes the key components of this situated learning process as involving: stories; reflection practices; cognitive apprenticeship - which acculturates people into practices through activity and social interaction; coaching; collaboration; multiple practice - where learners engage repeated activities to develop knowledge and skills; articulation of learning skills - where learners articulate their knowledge, reasoning and problem-solving processes, and; the use of various technologies to support these social learning processes.

According to Sense (2007b), the profound significance of this conceptual perspective on learning in a project setting can best be highlighted by summarizing the main themes of SLT, and then briefly commenting on their potential impact on learning in a project team. These themes include:

- Knowledge is conjoined to practice and therefore contextually situated and influenced by the social and cultural conditions of the practice (project knowledge is a direct result of the project practices and local mediating socio-cultural conditions).
- Social participation and interaction within a practice are essential for learning and knowledge development (learning and knowledge development and the social or technical competency development of participants within a project team will be suppressed unless they can actively participate together and interact).
- SLT involves collective sensemaking (Weick, 1995) or meaning-making processes, which helps participants make sense of their world of practice and enables them to operate productively within it (making sense of a project practice is always a collective process involving people, which then enables participants to develop individual ways of operating to successfully contribute to the project team).
- The development of the identity of participants within a practice is a negotiated process, which involves both their experiences and perceived social competencies within a practice (as an individual project team member develops both technical and social competencies within a project setting, they

develop an identity within the team, which has been mutually negotiated through their interactions with other team members).

Thus, SLT moves beyond the limitations of cognitive learning theory to directly involve the complex mediating sociological aspects of a context in the learning process. This theory provides a social-centred theoretical framework from which to understand and address learning in project environments.

### *Summary*

Conventional views on learning primarily reflect the cognitive dimension of learning (Lave and Wenger, 1991) where learning is seen as mainly cerebral, unproblematic, and involves the transmission and assimilation of de-contextualized information through the minds of individuals. This view also tends to leave unexplored the nature of the learner and their world and their relationships and interactions within a context (Lave and Wenger, 1991). Alternatively, SLT views learning as a socially located and co-constructed process, which is contingent on human relations and practices within a context. On the surface, these two seemingly quite opposite views of learning appear to be in some ontological conflict. Contrary to that perception however, both viewpoints are complementary for a complete understanding of how learning occurs in natural work situations (Gherardi *et al.*, 1998; Shani and Docherty, 2003). The cognitive dimension of learning is not, and cannot be divorced from situated or social practice within the context in which the cognitive learning process of an individual is enacted. It can be concluded then, that cognitive learning theory spotlights the cognitive aspect of a situated learning process (Sense, 2007b), and thus, the context and its sociological aspects mediate the cognitive learning activities of an individual and are an integral part of the knowledge creation process (Antonacopoulou, 1997; Coombs and Smith, 1998; Billett, 2000; Gherardi and Nicolini, 2000). This primal influence of the situational relationships suggests that the situated or social dimension of learning always frames the cognitive dimension, or as Gherardi *et al.* (1998, p. 274) state, “cognitive and practical activity can thus be pursued only within this world, and through this social and cultural network.” Hence, if one seeks to better understand and improve the complete learning activity of participants within any context, then paying systematic attention to the encompassing situated and social dimension of learning is of primary value (Sense, 2007b).

### **Managing knowledge flow**

The flow of knowledge in and around a project environment or any other environment takes two generalized forms. Hansen *et al.* (1999) and Kasvi *et al.* (2003) define these two general forms as codification (a technical dimension) and personalization (a social dimension).

#### *Codification*

Involves the ways in which explicit knowledge is codified, stored and then reused independently of its source and its context (Hansen *et al.*, 1999). Bresnen *et al.* (2003) consider this approach to be the cognitive model of knowledge management. Examples of codified knowledge can be artefacts such as manuals, documents, intranets, databases, guidelines and reports (Sense, 2007a, b). Codification seeks to put organizational knowledge into a form that makes it accessible to those who need it and

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the difficulty in doing so, involves how not to lose the knowledge distinctive properties and turn it into less vibrant information or data (Davenport and Prusak, 1998). Many people, particularly those involved in the information technology industry, may still consider that managing knowledge flow is primarily only about these codification processes, i.e. the storage and retrieval of information (Sense, 2007b). Increasingly however, other people consider that it is more about discovering and developing processes that value and cultivate a process of learning that is collectively shared - since the ability to change knowledge, i.e. to learn, is the real source of power (Willmott, 2000).

#### *Personalization*

Involves dialogue between individuals and is not focused on knowledge objects in a database (Hansen *et al.*, 1999). This approach is dependent on individuals as the means to transfer information and experiences to others, which then enables individuals' tacit knowledge (such as personal values, norms of behaviour and personal competencies and inadequacies) to be exposed and shared (Sense, 2007a, b). Davenport and Prusak (1998) and Linde (2001) consider narratives between people to be a most powerful means to achieve the exposure and capture of tacit knowledge. Personalization approaches necessarily require the space and time to enable people to get together to perform such personal exchanges and to develop their interpersonal networks – something that may be particularly problematic where people are dispersed over large geographical distances (Sense 2007a, b). Nonetheless, Hansen *et al.* (1999, p. 9) suggest that in the personalization approach, what is most important is to “have a system that allows people to find other people.” When that is achieved, the public exposition and sharing of tacit (and explicit) knowledge becomes more probable (Sense, 2007a, b). Highlighting such a situation is a construction industry case study performed by Bresnen *et al.* (2003), wherein, the company was attempting to develop explicit social mechanisms to encourage knowledge sharing and learning across projects. The project involved the introduction of new management practices in a construction firm. Their investigation illustrated the difficulties and limitations of adopting only an information technology codification approach to learning in projects, and how the processes of knowledge capture, transfer and learning relied heavily on social patterns, practices and processes, in ways which emphasized the value and importance of adopting a community-based approach (Bresnen *et al.*, 2003). They also concluded that because projects are spatially, temporally and culturally differentiated, knowledge is not as readily diffused as it might be in a well established community of practice (Bresnen *et al.*, 2003). Moreover, when Fernie *et al.* (2003) performed a study into the challenges of knowledge sharing across business sectors (i.e. a construction company and BAE aerospace) they concluded that knowledge was not able to be separated from the knower, and therefore, not readily captured and transferred across contexts. In effect, they took a people-centric view, where knowledge is essentially personal and any attempt at sharing it must engage the individuals concerned, and it must be facilitated in a socialized setting which aids dialectic debate (Fernie *et al.*, 2003).

When Scarbrough *et al.* (1999) did a review of knowledge management literature they found a significant gap within this literature revolving around the people management issues and a bias of focus towards developing and implementing databases, tools and techniques to codify knowledge and information (Sense, 2007a, b).



Therein, this literature was predominantly concerned with the implementation of new information technology systems for knowledge transfer (Swan *et al.*, 1999). Swan *et al.* (1999) report that where an organization (one of their case studies) attended to both the technical and social dimensions of managing knowledge flow, then exploitation of existing knowledge and exploration for new knowledge were both actively embraced. In contrast, their other case study, by being focused only on the technical and infrastructural issues, failed to engage the social and cultural aspects of the change process and exploration was not pursued, and even exploitation was limited (Swan *et al.*, 1999). Similarly, other evaluations of knowledge management processes in other firms (Davenport and Prusak (1998) and Ruggles (1998)) have shown that a lack of attention to these social factors has impaired the effectiveness of information technology implementations (Sense, 2007a, b).

Other literature in the knowledge management field has focused specifically on this human or social and cultural dimension of managing knowledge flow. This literature recognizes and argues that knowledge is complex and multidimensional and in constant interactive social development within and between humans within their contexts (Nonaka and Takeuchi, 1995; Choo, 1998; Davenport and Prusak, 1998; Lundin and Söderholm, 1998; Baumard, 1999; Swan *et al.*, 1999; Andrews and Delahaye, 2000; Brown and Duguid, 2000; Mårtensson, 2000; Wenger *et al.*, 2002; Bresnen *et al.*, 2003; Fernie *et al.*, 2003). For example, Nonaka and Takeuchi (1995), Baumard (1999), Mårtensson (2000) and Wenger *et al.* (2002) emphasize knowledge as being an eclectic mix of information that is coupled to individuals and their experiences within their practice contexts. Similarly, Brown and Duguid (2000) posit that resources for learning lie not simply in the information, but in the practice that allows people (participating within a practice) to make sense of, and to use the information available. In such circumstances, knowledge then travels with remarkable ease. In the same way, Fernie *et al.* (2003) claim that the creation and usage of knowledge is undoubtedly a human endeavour, and therefore, knowledge can only be of practical use through the interaction of individuals (Sense, 2007a, b). Such an emphasis then necessitates the people involved to engage in dialogue, negotiation and sensemaking (Weick, 1995).

### Summary

A personalization or social approach to knowledge management is particularly important in project learning activity since it is the agency through which tacit knowledge is exposed and shared. It can involve processes such as formal and informal dyadic or team meeting sessions, the provision of group and personal feedback to participants, and critical reflection activities within a team. These activities may place participants in multiple interactive situations to encourage their exposure, reflection on, and sharing of their valuable tacit knowledge. In addition, such actions may reduce interpersonal barriers to knowledge flow and significantly aid the building of participant learning relationships while also prompting confrontation with, and critical reflection on participants' learning behaviours (Sense, 2007b). A personalization approach may also illuminate other issues affecting project learning activity. For example, it may assist in building the awareness of the distribution of expertise or knowledge authorities in the project team which can limit the scope of knowledge capture or enquiry activities by participants. Or, it may expose for analysis, any

pre-occupation with sharing commonly held operational information as opposed to project information, which suppresses tacit knowledge flow on project related issues.

In contrast, the technical or codified approach to managing knowledge is inherently deficient in exposing and sharing tacit knowledge held by participants (Sense, 2007a). Consequently, information technology focused assumptions about knowledge being explicit, able to be captured, codifiable and stored and then retrieved in isolation to the conditions which created it, only addresses the smallest part of the knowledge iceberg (Fernie *et al.*, 2003). The technical dimension of knowledge management therefore really only plays a supporting role in the knowledge creation and management processes in projects – which perhaps presents a somewhat contrary view to that generally perceived in the wider project practitioner community at this time. Thus, and in unison with the views of Leonard-Barton (1995), Nonaka and Takeuchi (1995) and Choo (1998), it is argued that the establishment and maintenance of project conditions that support the social or personalized processes of participation, interaction, collaboration and dialogue between humans, is vital in enhancing knowledge creation and sharing in projects.

### **Implications for research and practice**

For researchers, the conceptual arguments presented in this paper may help direct their investigative attention towards, and stimulate critical scholarly debate on the social and practical aspects of learning and managing knowledge flow within projects. Within that framework, for example, the impacts on project learning activities resulting from issues concerning power and politics, individual participant styles, infrastructural issues of time, space and organizational support for learning, and the learning relationships between participants, may achieve greater exposure and deeper scholarly understanding.

For practitioners, the arguments presented in this paper mean that they will need to consider: project teams as dynamic and responsive constructors of their own learning processes; that project knowledge is conjoined to their practice and is therefore contextually situated and mediated by the sociological conditions of the practice and; that social participation and interaction within a project practice is essential for learning, for sharing and exposing knowledge and for the development of one's project identity (Sense, 2007b). In projects that have participants remotely located to each other, the adoption of this social constructivist's perspective towards these phenomena can be seen as particularly problematic. Nonetheless, it is important to raise the profile of this alternate and sociological way to conceive learning and knowledge management activities, as it constitutes a major influence on how practitioners can go about deliberately organizing project settings to improve their learning activity, and thereby better contribute to practitioner skill development and immediate project outcomes. In addition, any adoption of this conceptual perspective in practice may help energize participants' passion for learning within their projects, i.e. to develop their project learning libido (Sense, 2007b), because it provides a practical and approachable foundation on which to critically reflect on their current learning practices and on how they manage the flow of project knowledge within localized project settings. For further detailed discussions on the often complex and diverse implementation issues or dilemmas associated with adopting this sociological approach, Sense (2003, 2005, 2006, 2007a-d) and Sense and Antoni (2003).

## Conclusion

Beyond any myopic traditional perspective of project teams as only short-term and task focused entities, and in concurrence with the views advocated by Smith and Dodds (1997), Arthur *et al.* (2001), Morris (2002) and Sense (2007b), project teams actually also represent significant and under-utilized sites for learning and personal growth. The purpose of this paper was to examine how people can conceive learning and knowledge management processes within project teams, and in doing so, identify a conceptual framework that might best inform and guide peoples' efforts in effectively engaging these phenomena in the project environment. From this analysis, and with the intention to help improve the quantum and the quality of learning activity within a project, it is argued that project participants must acknowledge and pursue a more socially oriented trajectory in their learning and knowledge management activities.

Organizations would do well to consider promoting the adoption of this approach towards these project activities, since it: provides a pragmatic and approachable way to stimulate and progress the learning of participants while they interact "on-the-job"; can engage people in the collaborative and purposeful self-design of their learning activities, which increases the likelihood of application and learning success; underpins the practical development of project management skills and the learning-to-learn skills of participants, and; can facilitate participants' more reflective and informed contribution to project activities and thereby positively influence immediate project outcomes and process management performance. Within such a socially oriented-conceptual framework, the participants, their project practices and the organization of the project environment become the central points in developing a project into a more productive and generative learning unit. The achievement of these goals however, cannot be left only to chance actions or random, opportunistic interventions by participants within a setting. Instead, as this paper also advocates, organizations and participants therein also have a responsibility to purposefully and systematically nurture the socio-cultural conditions that will assist people in learning together and to share knowledge more effectively within a project setting.

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