

## **ORGANIZATIONAL LEARNING AND ORGANIZATIONAL DESIGN**

Carla Curado  
ISEG – Technical University of Lisbon  
Rua Miguel Lupi, 20  
1249-078 Lisbon  
PORTUGAL  
Phone: (+351) 21 392 59 65  
Fax: (+351) 21 392 28 08  
ccurado@iseg.utl.pt

### **ABSTRACT**

#### ***Literature review***

##### ***Approach***

*This paper explores a new idea presenting the possible relationship between organizational learning and organizational design. The establishment of this relation is based upon extensive literature review.*

##### ***Findings***

*Organizational learning theory has been used to understand several organizational phenomena, like resources and competencies, tacit knowledge or the role of memory in the organization; however, it is difficult to identify fits and consequent misfits between organizational learning and the organizational design.*

##### ***Research limitations***

*This one is a theoretical paper, so there is a possible limitation, regarding the lack of empirical support.*

##### ***Practical implications***

*At the end of the paper a number of recommendations regarding the organizational design are suggested, in order to promote organizational learning in the firms.*

##### ***Value of the paper***

*This paper identifies some links between organizational learning and organizational design, providing the grounds for a subsequent development and empirically testing of those relations.*

**KEYWORDS:** *Organizational learning, Organizational design.*

### **Introduction**

The Knowledge-based view of the firm is a recent extension of the Resource-based view of the firm very adequate to the present economic context. Knowledge is a very special resource in the firm and knowledge management should respect its characteristics. The nature of most knowledge-based resources is mainly intangible and dynamic, allowing for idiosyncratic development through path dependency and causal ambiguity. Designing

organizations in the present economic context should take into account organizational learning, as knowledge is considered to be one of the most important resources to the creation of sustainable competitive advantage.

Organizational learning seems to develop competencies that are valued by the clients, hardly imitable, and, as a consequence, they contribute to the competitive advantage of the firm. However the organizational learning process remains a “black box” to all researchers ([Crossan and Berdrow, 2003](#)). It is difficult to identify fits and consequent misfits between the organization learning and the organizational design, but we’ll try to do it using the literature.

In the information processing view, organizational designs are seen as a set of consistent choices determined by contextual factors such as the organization’s strategy and its environment ([Burton and Obel 2004](#)). Considering that the design of the organizational structure is contingent to the strategy the organization pursues (*e.g.* [Burton and Obel 2004](#)), we will try to enlighten the impact organizational learning can have on the organizational design.

According to [Eriksen \(2005\)](#) organizational designs have frequently been classified using systems metaphors, and the classical distinction between the organic and mechanistic designs offer two opposites in a continuum of design choices (*cf.* [Burns and Stalker 1961](#)). Organic systems are frequently described as loosely coupled systems where there is little formalization, where complex integrating mechanisms are used, and decision making is delegated. In contrast, mechanistic organizations are highly formalized and centralized, and tend to use less complex integration mechanisms ([Miller and Dröge 1986](#), [Lawrence and Lorsch 1967](#), [Mintzberg 1979](#)).

#### **There are different ways of thinking organizational learning**

The domain of strategic management has developed a fertile field of investigation that allow researchers to search for the best perspectives in analysing key aspects that influence organizational success. One of the possible perspectives is organizational learning as some authors have identified ([Mintzberg \*et al.\*, 1998](#), *apub*, [Crossan and Hulland, 2002](#)). This approach to strategic management should be very important, as organizational learning might turn out to be the unique sustained competitive advantage of the firm ([Geus, 1988](#)). Unfortunately, though there is large literature on organizational learning, this subject is rarely associated to strategic topics ([Crossan and Berdrow, 2003](#)). The concepts of learning and capability development only recently have been considered in the context of the firm’s strategic development, exploring the differences in organizational resources and assets ([Lei \*et al.\*, 1996](#)), as described by [Prahalad and Hamel \(1990\)](#) and [Collis \(1991\)](#).

Knowledge management literature associates superior knowledge bases, resulting from organizational learning, to superior firm performances ([Senge, 1990 \*apub\* Garvin, 1998](#)), as well as it presents differences in knowledge inventories as the basis of competitive advantage ([Miller, 2002](#)). A superior knowledge base can be associated to higher strategic flexibility and faster reaction to environment changes ([Grant, 1996b](#); [Volberda, 1996](#)), so, knowledge is considered to be one of the most important assets to the creation of sustainable competitive advantage ([Umemoto, 2002](#)).

The ontological dimension of organizational learning (the subject who learns) is repeatedly presented in the literature in two levels, the individual one and the collective one. There is a wide recognition of the coexistence of organizational learning at both levels. [March \(1991\)](#) presents us in his paper the concept of mutual learning, considering that both, the individual and the organization, learn: the organizational knowledge is leveraged through the individuals, in different ways, as instruction, doctrine, or exemplification. Simultaneously, according to March, the organizational code adapts itself to the beliefs of

the employees. This way the mutual learning produces results on the individual and organizational levels.

There are several different definitions and concepts of organizational learning, and there is no universal agreement on the phenomenon. However, most researchers consider that organizational learning is the product of organizational members' involvement in the interaction and sharing of experiences and knowledge. This shared form of knowledge is bigger than the simple added of the individuals' learning capacities. This implies that individual learning is a necessary, but not sufficient, condition for organizational learning to occur. The information distributed through the organization's members is shared and interpreted in an organizational way. Even though, individual learning and organizational learning are somehow of different essences; the former is essentially a cognitive process, and the last is mainly a social process (Tetrick and Da Silva, 2003).

There is an argument much used that states that organizational learning is a particular form of learning developed in organizations through key individuals, which can be associated to subsequent organizational changes ([Cook and Yanow, 1995](#)). There are some anthropological studies that have verified that these key individuals learn to be able to teach the rest of the population. This phenomenon is frequently associated to renewing processes (Czarniawska, 2003).

Another approach to organizational learning considers that organizations learn because they have capabilities that are identical, or equivalent, to those individuals have and that allow them to learn. This approach looks at organizations as if they were individuals. Although different, both perspectives address the subject of organizational learning from a similar point of view: the nature of the organizational learning is, implicitly or explicitly, associated to the meaning of individual learning. This way, a relation between organizational learning and the theories of cognition can be established. As a result, this perspective on organizational learning is referred to as the "cognitive perspective" ([Cook and Yanow, 1995](#)).

The cognitive perspective presents the fragility of being too close to individual cognition theories, which are controversial, complex and multiple. As a consequence, a group of criticisms arise: the ones directly referring to the ontological aspect of considering the organization as a cognitive entity; the ones about the complexity of the phenomenon; the ones referring to the difficulty of verifying if organizational learning is comparable to individual learning, and the ones on the association that is being done between organizational learning and organizational change ([Cook and Yanow, 1995](#)).

Miller in 1996 dedicated himself to collect bibliography on organizational learning, synthesising the literature in a typology guided by two dimensions: voluntarism vs determinism, and method vs emergence. The first one reflects the way organizational actions are limited, distinguishing the free and autonomous organizational learning from the one that is oriented through cognitive, political, ideological or resource-based structures. The second dimension reflects the way organizational thinking and action is practiced, distinguishing organizational learning that is guided by concrete methodological analysis, from the organizational learning that is spontaneous and emergent, guided by rituals or individuals guesses.

Organizational learning and the creation of knowledge are processes that have been conceived in several ways (Antal *et al.*, 2003). The diversity and heterogeneity of the contributions make it necessary to describe the concept of organizational learning in different perspectives. The divergence between different approaches has enlarged and still we have not found a unique and common analytical or conceptual model that serves as a framework for academic research ([Pawłowsky, 2003](#)).

**What is organizational learning?**

The scientific conception of knowledge in organizations is still in an early stage of development, although a large and growing body of literature on organizational knowledge, organizational learning, knowledge creation and knowledge management is emerging. In these domains there is also a diversity of concepts, theoretical frameworks, terminologies, hypothesis and evidence ([Nonaka and Nishiguchi, 2001](#), *apub*, [Griffith et al., 2003](#)). The deficiencies in research in the domains of knowledge management, organizational learning and organizational memory remain because of the lack of a common language, and the inexistence of a unifying paradigm that gathers factors influencing work and knowledge. As a result, there is a necessity for the development of a common vocabulary in this research field ([Croasdell et al., 2003](#)).

Organizational learning has been defined following Miller as the knowledge acquisition made by actors (individuals and groups) when these can and are available to apply it in the decision making process, or use it to influence others within the organization ([Miller, 1996](#)). The concept of organization has evolved, so has the research focus. The research based on the traditional paradigm considered that learning was a process mainly focused on the acquisition, the distribution and the storage of knowledge in the memory. The research that is being conducted within the new paradigm, recently developed, focuses on way the organization processes information and generates knowledge ([Antal et al., 2003](#)).

The new forms of organization also include some international forms. Referring to the international dimension of organizational learning [Martin and Salomon \(2003\)](#) present us large bibliography to support it. According to these authors, there is literature supporting the relevancy of organizational learning in the propensity of the firm to transfer knowledge to the outside. The “outside” relates to the transfer of knowledge between different locations of multinational organizations. The aspects of organizational learning within multinational firms ([Macharzina et al., 2003](#)), through strategic alliances ([Child, 2003](#)), in international joint ventures ([Lyles, 2003](#)), or supply nets ([Lane, 2003](#)) are some examples of how organizational learning may achieve that international dimension. However, it is still beyond total understanding how organizational learning might affect the foreign investments options ([Martin and Salomon, 2003](#)).

Since [Cyert and March \(1963\)](#), *apub*, ([Pawlowsky, 2003](#)), first used this expression, and particularly since the work by [Argyris and Schön \(1978\)](#), *apub*, ([Pawlowsky, 2003](#)), the concept of organizational learning has been used in different ways and in several disciplines. The amount of literature on this subject that has come out in the last two decades is huge ([Pawlowsky, 2003](#)). In the last decade, has emerged some literature establishing the relationship between the organizational capabilities and the competitive performance of the firm. Simultaneously to this, the interest on the concept of organizational learning has been renovated. Although this concept triggers organizational theorists since long, the proposition that competitive advantage emerges from firm specific competences and capabilities, turned this subject into a fundamental aspect of the domains of competitive strategy and organizational behaviour ([Pisano, 2000](#)), and authors work now on searching for associations between organizational learning and firm performance (*e.g.* [Ambler and Styles, 2002](#)).

[Huizing and Bouman's](#) definition of knowledge management is a good example of the work being done to involve organizational learning in the strategic concepts: according to theses authors, knowledge management is the organizational discipline bridging between information demand and supply, creating a support for organizational learning ([Huizing and Bouman, 2002](#)). This relationship has been empirically developed and presented in literature ([Crossan et al., 1999](#); [Bontis et al., 2002](#); [Crossan and Hulland, 2002](#); [Crossan and Berdrow, 2003](#)) creating a parallelism between knowledge management strategies and organizational learning flows. As [Antal et al. \(2003\)](#) put it: there are two perspectives in the

organizational learning domain, one considering the pre-existing knowledge that is shared and used, and another analysing how new knowledge is created.

Organizational learning is a social phenomenon. Each individual's learning depends upon the knowledge that other members of the organization possess (Figueiredo, 2003). The social interaction facilitates not only the communication and coordination, but also learning. The meaning, the understanding and the learning are defined according to a context. Learning through the identification with the organization is more powerful than trying to "teach" the individuals using incentives. Learning is located at an entity that is why it is so difficult to unlearn (Kogut and Zander, 1996). There are different levels of learning that coexist in the organization, from individual learning to team learning and organizational learning. Employees require opportunities to share and learn in groups. (Saint-Onge and Armstrong, 2004).

### **How can we find organizational learning in the organizations?**

In order to leverage knowledge-based resources throughout the organization, the firm should promote the organizational learning (Tetrick and Da Silva, 2003). Knowledge diffusion and leveraging inside the organization creates efficiency in addition to knowledge transfer (Hitt *et al.*, 2001a). The capabilities and the knowledge associated to competencies create through time, historical dependence or path dependence (Collis, 1991; Winter, 1987). This will develop barriers to imitability, as it originates some difficulties for other firms to recreate the unique historical evolution of each organization that truly produces its competitive advantage (Lei *et al.*, 1996). Through the use of dynamic competencies, the organization integrates builds and reconfigures its internal and external capabilities to face the fast changing environments (Teece *et al.*, 1997). Organizational competence emerges through time as a process of organizational learning (Levitt and March, 1988, *apud*, Szulanski, 2003).

There are continuously appearing enhancement and improvement organizational programmes. These programmes proliferate because firms anger to improve and win the markets. However, the failures outnumber the successes, and the improvement rates continue low. This happens because organizations do not understand something fundamental: before people and organizations are able to improve they must learn (Garvin, 1998). Competitive success depends on learning, and most people do not know how to learn (Argyris, 1998).

The training and development programmes are generally used to promote organizational learning. These programmes aim to enhance the firm's knowledge capital. Many of them ensure that members of the organization have at their disposal the most up to date explicit knowledge in their different expertise areas (DeNisi *et al.*, 2003). However, little attention has been done to the study of the contributions different organization's members give to organizational learning and knowledge creation (Antal *et al.*, 2003). Organizational learning agents are the elements of the organization (Antal *et al.*, 2003) as the individuals (Friedman, 2003), the organizational practices (*e.g.* leadership) (Sadler, 2003), the groups (*e.g.* as the board of direction) (Tainio *et al.*, 2003), syndicates (Drinkuth *et al.*, 2003), or even consultants (Antal and Krebsbach-Gnath, 2003).

Can organizations learn? This is not an epistemological question about the cognitive capabilities of the organization, but an empirical question about the actions of the organization, to which the answer is yes (Cook and Yanow, 1995). Social aggregates possess more knowledge than individuals. Groups are superior to individuals regarding to total amount of information they can store. However, within an organization knowledge can be spread in a very unequal way through different groups and unities (Maier *et al.*, 2003). Unfortunately, there is a scarcity of analytical frameworks and supporting empirical evidence to explain the role of intra-firm learning processes (Figueiredo, 2003).

Where as a simple punctual organizational learning event can be relatively easy to imitate by other firms, the continuous organizational learning activities have a cumulative effect much harder to imitate. As a result, the continuous organizational learning appears to be a characteristic that serves as a base of sustained competitive advantage (DeNisi *et al.*, 2003). Being a process, organizational learning is sentenced to last more time than a simple event Maier *et al.*, 2003). Causal ambiguity is strongly associated to path dependency or historic dependency (the accumulation of experiences, learning, errors and successes) as it creates a reality (values, language, communication, products, technology, *inter alia*) with multiple and complementary origins hardly replicable. Organizational learning is a way to build causal ambiguity (a way to make difficult for other firms to imitate the organization) and establishing a base for competitive advantage (Lei *et al.*, 1996).

Organizational learning literature and firm evolution theories evoke several times the expression “path dependency”, which reflects clearly the importance of history in social sciences. The historical path is very important because learning – whether social, organizational or individual – is a difficult process, which requires evaluation of the past and even its reconsideration, the change of the present and the confrontation with the future. By definition, learning implies having some kind of sense, or knowledge from experience accumulated to allow change (Fear, 2003).

How does the firm create knowledge about its past and present circumstances? The memory of past events requires the firm to have a notion of its one history, which can become highly problematic. Individual memory is proven to be very fallible, and organizational or collective memory involves serious questions. Both individuals and organizations build their histories as narratives and create myths. They both operate on memories of their shared pasts, and this memories are not necessary precise nor transparent. By story telling (orally or written) it is created knowledge about the past, which is not necessary relevant or correct (Fear, 2003).

Knowledge-based approach opens up new questions about the interaction of the explicit and tacit (Polanyi, 1962) knowledge assets (Spender, 2002). This new organizational reality challenges the traditional planning, organizing, leadership, controlling, accounting and other organizational practices (Sveiby, 1997), (Guthrie, 2001), (Mouritsen *et al.*, 2001). Firms need to redefine their strategies and functions to compete in the knowledge era. The “knowledge intensive firms” represent the new kind of organizations that employ large proportion of highly qualified staff (the “knowledge workers” - Drucker, 1993) (Blackler, 2002). The knowledge-based competitive advantage (Nonaka, 1991), (McEvily and Chakravarthy, 2002) is sustainable because the more a firm already knows, the more it can learn (“*absorptive capacity*” - Cohen and Levinthal, 1990). Knowledge management gathers its creation and transfer (Sveiby, 1996), (Nonaka *et al.*, 2000), (Buckley and Carter, 2000), (Choo, 2002), (Zack, 2002).

Following the words by Nonaka (1991) “... the only true lasting competitive advantage is knowledge...” we are able to find some related concepts like the knowledge-based organization (Blackler, 2002) and the knowledge-based advantage (McEvily and Chakravarthy, 2002). These authors recognize that non-observable factors have impact on firm performance. Those factors, as management capabilities and competences, technical knowledge or tacit organizational routines, may turn out to be the main determinants of firm performance (Dess *et al.*, 1995).

Organizational learning is the improvement of the organizational knowledge base. We should be able to distinguish knowledge from learning. Knowledge is made of what we know at a certain point in time. Learning is made of the accumulation and the modification of what we know; it is the dynamics, or change process, of knowledge (Burton and Obel, 2004). Learning is related to knowledge, in the way that it is the act of acquiring

knowledge (Cook and Yanow, 1995). Time constitutes one of the factors that influences learning in the organizations (Weber and Antal, 2003). Tough, there is a temporal dimension of organizational learning.

The different organizational levels at which organizational learning occurs also introduce some dynamism in the concept. Garvin (1998) proposes three levels in the development of organizational learning. The first phase corresponds to the cognitive level. Organizational members are exposed to new ideas; as a consequence they expand their knowledge and start thinking in a different way. The second phase is behavioural. Employees start to internalise new perspectives and as a consequence they alter their behaviours. The third and last phase is when performance improvement occurs. This happens when the change in behaviour lead to measurable improvements in results (superior quality, better delivery, market share value increase, or other tangible profits).

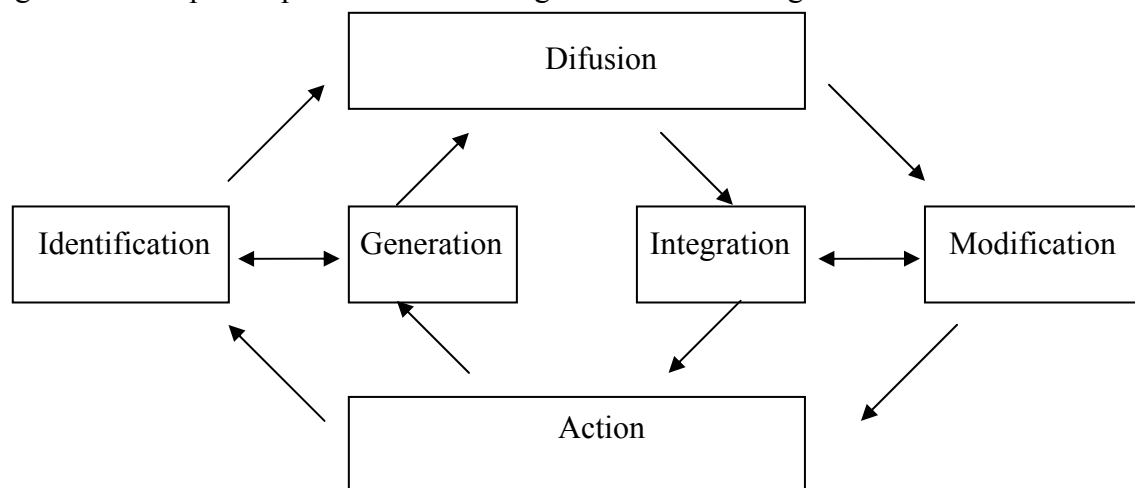
It is quiet small the number of analyses and empirical evidence gathered in order to explain the role of learning processes within the organizations. Even though, the author synthesized several contributions from literature into a typology considering four processes; two knowledge acquisition mechanisms and two knowledge conversion mechanisms (Figueiredo, 2003):

Regarding the knowledge acquisition mechanisms, the author established two organizational learning processes: external knowledge acquisition and internal knowledge acquisition. The first represents the processes through which individuals acquire tacit or codified knowledge from the exterior of the organization (like overseas training programs). The second represents the processes through which individuals acquire tacit or codified knowledge by performing different tasks at the organization (like product development).

Regarding the knowledge conversion mechanisms, the author established two organizational learning processes: knowledge socialization and knowledge coding. The first represents the processes through which individuals share their tacit knowledge - mental models, technical aptitudes (like in meetings and shared problem-solving). The second represents the processes through which individual tacit knowledge (or part of it) becomes explicit, articulated in concepts, available to all in organized and accessible supports and easy to understand (like in systematic documentation and internal seminars). It is immediate the identification of the influence of the SECI (Socialization, Externalisation, Combination, Internalisation) model by Nonaka and Takeuchi (1995) in this typology by Figueiredo.

Another author, Pawlowsky (2003), presents us an organizational learning simple but very clear model, as in Figure 1.

Figure 1. A simplified process model of organizational learning.



Pawlowsky, 2003.

Basically, the process phases of organizational learning are described in terms of four steps, which continuously repeat themselves and are not necessarily sequential (Pawlowsky, 2003):

1. The identification of information that seems relevant to learning, to the creation (generation) of new knowledge, or both (e.g. Nonaka's "Socialization", [Nonaka, 1994](#));
2. The exchange and diffusion of knowledge, either from the individual to the collective level or at the collective level itself (e.g. similar to Pawlowsky's prior reference, we can establish a parallelism between this phase and the "Externalisation" of the Nonaka and Takeuchi (1995) SECI model);
3. The integration of knowledge into existing knowledge systems at a collective level, an individual level, or both, or into procedural rules of the organization, whereby either integration or modification of the adopting system can take place (e.g. we can also establish here a parallelism between this phase and the "Combination" of the Nonaka and Takeuchi (1995) SECI model);
4. The transformation of the new knowledge into action and the reapplication of the knowledge into organizational routines, so that it has effect on organizational behaviour (e.g. the development of new leadership styles or new products and services).

Organizational learning is a dynamic process that does not happen only through time, but also through different levels or dimensions of the organization. The dynamics is created through the tension between the organizational assimilation of new knowledge developed at individual level (*feed-forward*), and the use and individual exploration of organizational pre-existing knowledge (*feedback*). This tension occurs because organizational learning is not only the innovative process associated to *feed-forward*, but also the *feedback* process, which generates ways to explore what has already been learnt ([Crossan et al., 1999](#)).

Crossan and Hlland, (2002) use an organizational learning framework – developed in 1997 ([Crossan et al., 1997, apub](#), [Crossan and Hlland, 2002](#)) and latter used by several other authors ([Mintzberg et al., 1998, apub](#), [Crossan and Hlland, 2002](#); [Crossan et al., 1999](#); [Bontis et al., 2002](#); [Crossan and Berdrow, 2003](#)) – to demonstrate the relationship between learning, knowledge and strategy. According to the authors ([Crossan and Hlland, 2002](#)) there are two organizational learning flows: *feed-forward* and *feedback*, corresponding to the two knowledge management strategies presented by [March \(1991\)](#), *Exploration* and *Exploitation*:

*Exploration* consists on the development of learning routines that the organization establishes to ease the development of new products and processes. Flexibility, research, risk taking, experimenting and innovation are significant components of this knowledge management strategy.

*Exploitation* consists on the development of learning routines to refine products, processes and pre-existing knowledge. Choice, production, efficiency, selection, implementation and execution are significant components of this knowledge management strategy. Increases in the use of this strategy are associated to decreases in firm performance variability.

*Feed-forward* learning flows correspond to learning processes that go from the individual to the organization, where as *feedback* learning flows represent the impact that organizational learning has at individual level ([Crossan and Berdrow, 2003](#)), an evident parallelism can be drawn:

*Feed-forward* learning flows correspond to the *Exploration* knowledge management strategy and it comprehends the individual learning effort to develop new applications, products or processes. This kind of learning involves individual acts of creation, experimentation and innovation, having in perspective the use of future knowledge. This learning flow moves to the organizational level and wide-spreads the individual

contributions. *Feed-forward* - the transfer of knowledge from the individual to the organization - corresponds to the *Exploration* (Crossan, 2004).

*Feedback* learning flows correspond to the *Exploitation* knowledge management strategy and it comprehends all the organizational learning potential to refine pre-existing knowledge and reuse it, applying current collective knowledge. This learning flow moves from the organizational level to the individual level, wide-spreading the most efficient practices. *Feedback* consists in getting institutionalised learning back to the individuals that means it corresponds to the *Exploitation* (Crossan, 2004).

Crossan (2004) considers that there are important implications in balancing the tension between *Exploration* and *Exploitation*. According to the author, a firm that manages well organizational learning is able to develop new and innovative ideas, as well as institutionalise and bring learning to the individuals and apply it in the organization.

The problem of balancing *Exploration* and *Exploitation* is exhibited in distinctions made between the refinement of an existing technology and the invention of a new one (Winter, 1997, *apub*, March 1991; Levinthal and March, 1981, *apub*, March 1991). Organizations learn from experience how to divide resources between *Exploration* and *Exploitation*. Compared to returns from *Exploitation*, returns from *Exploration* are systematically less certain, more remote in time and organizationally more distant from the locus of action and adoption. Organizations, through adaptive processes, characteristically improve *Exploitation* more rapidly than *Exploration*. The advantages of *Exploitation* cumulate. Each increase in competence at an activity increases the likelihood of rewards for engaging in that activity, thereby further increasing the competence and the likelihood of rewards (March, 1991).

Comparing both strategies according to dimensions as efficiency and efficacy, it seems reasonable to suggest two propositions: efficacy shall be more close to *Exploration*, as efficacy is driven to the exterior and benefits from innovation; where as efficiency shall be more close to *Exploitation*, as efficiency is driven to the interior and benefits from the refinement of processes. Tallman (2001) presents us the differences between both strategies regarding the return over time: *Exploitation* generates present rents; on the contrary, *Exploration* originates the capability to generate future rents.

Organizations divide their attention and other resources between the two kinds of activities; *Exploration* – the pursuit of new knowledge, of things that might come to be known; and *Exploitation* – the use and development of things already known (Levinthal and March, 1993). Lovas and Ghoshal (2000) propose that the combination of both strategies is possible. According to these authors, firms that apply both strategies in parallel will obtain synergies and best performances in the long run, and for several other authors the combination of both strategies is also an important option (Knott, 2002; Ichijo, 2002; Bierly and Daly, 2002).

Both strategies are not mutually exclusively, the ideal situation for the firm might be the balance between them (Zack, 2002). *Exploration* allows for knowledge creation that can drive the firm into news markets and present new products, maintaining the old ones. *Exploitation* generates funding to support innovation costs. *Exploration* without *Exploitation* is not economically sustainable in the long term, apart from subsidized activities. *Exploitation* without *Exploration* might result in the long run in exploring obsolete knowledge. Zack (2002) calls the organizations that are able to combine and integrate both strategies as innovators. The application of the two strategies is not conflicting, for these are applied in different parts of the organization, separately in time, and must be coordinated in order to mutually reinforce their effects.

An organization that engages exclusively in *Exploration* will suffer from the fact that it never gains the returns of its knowledge. An organization that engages exclusively in

*Exploitation* will suffer from obsolescence. The basic problem confronting an organization is to engage in sufficient *Exploitation* to ensure its current viability and, at the same time, to devote enough energy to *Exploration* to ensure its future viability (Levinthal and March, 1993).

Bierly and Daly (2002) propose the expression bimodal apprentices to call the firms that strongly apply both strategies simultaneously. Such organizations are rare and they do something quite paradoxical; they develop new knowledge, radically different and innovative and, at the same time, they manage to keep creating value from pre-existing knowledge in the firm in a continuous and incremental way. According to the authors, a big firm should have some advantage over the smaller one in achieving to be a bimodal apprentice, as it is more capable to access the necessary resources and dispose of a complex structure able to manage multiple sub-cultures.

Knott (2002) gathered empirical evidence in support of the proposition that combining both strategies reinforces each one of them. There is a complementary effect between the two opposite strategies: *Exploitation* (static optimisation) and *Exploration* (dynamic optimisation). According to the author, firm success in competitive environments involves *Exploitation* of existing firm competencies, while surviving in dynamic environments involves the *Exploration* of new competencies. Ichijo (2002) presents the dual option as the one involving the use of both strategies in order to be able to manage different knowledge categories. The two strategies are indispensable to enlarge the firm's competitive advantage.

Organizations that choose one of the strategies to rent its knowledge base generally don't use the other one. According to the organizational choice, the firm needs different kinds of structure, culture and organizational capabilities most adequate to the strategy adopted (Bierly and Daly, 2002). However, [March \(1991\)](#) considers that understanding the choices and improving the balance between *Exploration* and *Exploitation* in the organizations are complicated by the fact that returns from the two options vary not only with respect to their expected values, but also with respect to variability, their timing, and their distribution within and beyond the organization.

What kind of fits (and consequent misfits) can we find?

From the outset, the notion of "strategic integration" is composed of two dimensions: the external fit refers to the integration of organizational learning into the overall business strategy; and the internal fit relates to the internal coherence and mutual reinforcement of the different policies and practices that compose the organizational learning system. From the notion of external integration a contingent perspective might propose the adoption of different organizational learning systems to fit diverse business strategies and organisational contexts. Here, it is the alignment between organizational learning and business strategy that grants knowledge management its strategic status.

Organizational learning has been conceptualised in a limitative way, being frequently described as an emerging process of try and error, or even random. Other reducing perspectives on organizational learning, like presenting it as a rational process from the domain of choosing and decision-making, do not capture the richness of the phenomena that is embedded in interpretative systems, communities of practice, dialogue and memory. But, by considering that organizational learning establishes a relationship between environmental change and business strategy, or even attributing organizational learning the capacity to change that relation over time is a way of recognising that organizational learning is strategically relevant ([Crossan and Berdrow, 2003](#)). Therefore, from the notion of external integration we must recognise the importance and necessity for an external fit referring to the integration of organizational learning into the overall business strategy.

The concept of internal fit, on the other hand, calls for the implementation of a specific ideal set of organizational learning practices thought to work best in all organisations that emerges from the special characteristics organizational learning presents, as literature tells us. Maintaining a balance between *Exploitation* and *Exploration* is complicated because it is difficult to determine what the appropriate balance should be, but also by several ways in which learning itself contributes to imbalances. Learning leads organizations into dynamics of accelerating *Exploitation* or *Exploration*, and learning can make positive, or negative, contributions to the competitive position (Levinthal and March, 1993).

Organizations become trapped in one or more of several dynamics of learning that self-destructively lead to excessive *Exploitation* or excessive *Exploration*. These dynamic distortions of the *Exploitation/Exploration* balance occur and they are not perverse, they are a consequence of adaptation processes that lead to effective matching of organizational behaviour with environmental conditions (Levinthal and March, 1993). The trade-off between *Exploitation* and *Exploration* emerges as a result of diverging demands for organizational designs in different contexts (Burton and Obel 2004)

Sometimes *Exploration* drives out *Exploitation*; organizations make an option into experimentation, changed and innovation. Failure leads to search and change which leads to failure which leads to more search, and so on. New ideas and technologies fail and are replaced by other new ideas and technologies. Sometimes *Exploitation* drives out *Exploration*, because returns to *Exploitation* are closer in time and space than are the returns in *Exploration* (Levinthal and March, 1993).

The learning organization should be the one where organizational learning truly occurs. The learning organization (Garvin, 1998) is the one that is able to create, to acquire and to transfer knowledge, and, at the same time, it manages to modify its behaviour reflecting new knowledge and new perspectives. This organization is characterised by presenting special ability in performing five main tasks:

1. Systematic problem solving – this activity makes use of philosophy along side with improving quality methods. In this task there is a permanent search for overcoming difficulties and finding solutions.
2. Experimentation – this activity involves the systematic search and validation of new knowledge. In this task, as in the previous, the use of a scientific methodology is essential, and there are obvious parallels with the problem solving activity. However, experimentation is generally motivated by catching opportunities and not by current difficulties.
3. Learn from past experiences – this activity happens when organizations reanalyse carefully their failures and successes, evaluating them systematically, and recording the correspondent lessons, so that it allows for organizational members to access them in a free and simple way.
4. Learning from the others – this activity reflects the learning that does not come out of self-reflection and analysis. Sometimes the most interesting ideas can be generated from looking around, outside the immediate working environment and acquiring new perspectives.
5. Transferring knowledge – this activity makes learning something more than a local phenomenon. This task allows for knowledge to be leveraged rapidly and efficiently throughout the organization. Ideas that are widely shared produce maximum impact.

Therefore, from the notion of internal integration we must recognise the importance and necessity for an internal fit referring to the integration these tasks into the organizational learning systems. Organizations learn through individuals that act as agents. Individual learning activities may be promoted or inhibited by a system of factors, which we can

denominate as organizational learning system. Organizations may learn if their potential behaviours are changed through information processing systems (Croasdell *et al.*, 2003).

Regarding the misfits, we can gather a number of limitations that organizational learning has to face. There are recurrent errors that organizations do when they try to become a learning organization (Argyris, 1998):

1. Associate learning purely to problem solving activities, which strongly limits it. When this situation occurs, the organization centers its attention only in identifying and correcting problems. Learning demands critical self-reflection, beyond simple problem solving, to try to identify how, by chance most of the cases, one contributes to organizational problems. This self-analysis should even question if the way problems are being defined and solved isn't itself originating problems.

2. Considering that organizational learning is a unique and exclusive question of organizational members' motivation, which is wrong. Organizational learning is not automatic, nor fluid, this means, it doesn't restrict to the immediate consequences of employees correct attitudes or personal dedication. Never the less, some organizations consider this is what organizational learning is about, and develop new organizational structures designed to motivate employees. Don't forget that learning is influenced by the way individuals feel in the organization, and it also reflects the way they think – the set of cognitive rules and reasoning they make use to design and implement their actions.

The same author (Argyris, 2001) presents us the limits to organizational learning typified in two large groups of physiological mechanisms: individual and organizational. The first one regards the individual barriers to organizational learning, consisting of defensive strategies to avoid vulnerability, risk taking, embarrass, and incompetence demonstrations. The second group relates to the universal phenomena that Argyris (2001) calls *defensive organizational routines* – the organizational barriers, and these ones can produce misfits. Defensive organizational routines consist of policies, practices and actions that avoid people to experience embarrass or threat and, simultaneously, avoid that they examine the causes of such situations. The communication systems that managers try so hard to perfect also reinforce these kinds of barriers. The organizational routines work as internal barriers to self-understanding and self-examination, so in some cases is a miracle for organizational learning to take place.

Why can't organizations learn? There must be some kind of misfits that account for that. According to Schein (1996), organizational learning failures may come from communication failures between three "cultures". The three different cultures compose the organization and are as follows: operational, engineering and executive cultures. The first one, operational culture, relates to local culture developed in each organization or unity and it is based upon human interaction. The second one, engineering culture, relates to the elements that design the organizational technology support, and the way it will be used. The last one, executive culture, consists in maintaining the finance wealth of the organization, regarding the Administration, the investors and the capital markets. When organizations redesign, or reinvent themselves, these cultures might collide and some failures might happen. The author prescribes inter-cultural dialogue in order to promote mutual understanding and develop solutions for the three of them to apply (Schein, 1996).

#### **How can we establish an organizational design for organizational learning?**

Considering the key organizational design variables establishing the classical distinction between the organic and mechanistic designs (corresponding to the two opposites in a continuum of design choices), we can summarize the differences in Table I.

Take in Table I.

Using this dichotomy we are tempted to say that in designing the organization for organizational learning it might be better to follow the organic design approach,

characterized by low formalization and centralization and high integration, instead of considering to follow the mechanistic design approach, characterized by low integration and high formalization and centralization.

Management literature often addresses the necessity to have a concept of organizational change adequate to the turbulent and complex business environment. Management faces new patterns and combinations of old variables, as well as fundamental changes in the business logic and the assets used. Innovation, growth and productivity gains do not result from separating tasks and breaking the workflows of the knowledge-intensive operations, but rather from integrating and combining knowledge in order to jointly develop new ideas and solutions through problem solving processes. Being so, one of the main challenges management faces is to understand the roles of knowledge and learning to allow for organizational change and business success ([Pawlowsky, 2003](#)). The integration and combination of knowledge is a good way to design the organization for organizational learning, instead of separating tasks and breaking the workflows of the knowledge-intensive operations.

In order to leverage knowledge-based resources in its interior the organization should promote organizational learning ([Tetrick and Da Silva, 2003](#)). Culture, firm reputation and learning are intangible components of the organization's resources patrimony ([Levitas and Chi, 2002](#)). Learning allows organizations to acquire, change and preserve organizational capabilities ([Cook and Yanow, 1995](#)). Diffusing and leveraging knowledge within the firm creates efficiency, in addition to knowledge transfer ([Hitt et al., 2001a](#)). There is a knowledge management literature that associates superior knowledge bases, resulting from organizational learning, to superior firm performances ([Senge, 1990](#) *apub* [Garvin, 1998](#)), as well as it presents differences in knowledge inventories as the basis of competitive advantage ([Miller, 2002](#)).

Resources like knowledge, learning capabilities, culture, teamwork and human capital, *inter alia*, are presented as being the ones that most contribute to the firm sustained competitive advantage ([Hitt et al., 2001a](#); [Barney, 2001a](#)). Organizational capabilities emerge over time through organizational learning processes ([Levitt and March, 1988](#), *apub*, [Szulanski, 2003](#)). As a consequence, the maintenance of the competitive advantage of the firm might depend upon past decisions and the way employees learn from past experiences ([Alvarez and Busenitz, 2001](#)). Leveraging knowledge throughout the organization enlarges the knowledge base and develops a sharing culture that is a stimulus to organizational learning. These routines are a good way to design the organization for organizational learning, instead of promoting internal power distances associated to differences in knowledge stocks.

Knowledge intensive firms abandon formal structures and reach coordination through social reward and internal normative systems, instead of hierarchical control. Firm dimension is a relevant factor for these organizations. When knowledge intensive firms grow bigger, they become more bureaucratic ([Starbuck, 1992](#)). The structure and the process are among the most mentioned topics on the works of researchers studding the "*productive process*" of transforming knowledge into knowledge-based products and services. The dilemma between autonomy and control is also frequently mentioned in literature. We find arguments in defence of the resolution of such dilemmas based on cultural and normative processes, rather than using hierarchy and structure ([Rylander and Peppard, 2004](#)). Social reward and internal normative systems are a good way to design the organization for organizational learning, instead of formal hierarchy and structured incentives.

Several organizational learning models associate external change to the necessity to learn. Socio-economic values are changing drastically in many countries, making it essential for

organizations to acquire and maintain the ability to perceive the necessities of its multiple internal and external stakeholders. Social dynamic pressures the organization to learn about different subjects. It would be a mistake to consider that environment changes only produce passive reactions from the organization. On the contrary, such reaction might even involve technology development or market diversification, if organizations have efficient learning systems management (Antal *et al.*, 2003). A dynamic approach to social change is a good way to design the organization for organizational learning, allowing for new developments and diversification, instead of a passive view of business.

One principal goal of economics is to help understand innovation and change. It is therefore surprising for many observers that mainstream economics has largely failed to develop a coherent approach to one of the primary means by which individuals innovate and change: learning. The neglect of learning in economics stems in part from the fact that economics is built upon a set of highly stylised assumptions about the behaviour and decision-making processes of economic agents. In the environment based on these assumptions, agents are perfectly rational and able to respond optimally and instantaneously to changing conditions (Boerner *et al.*, 2003). Recognising that individuals are able to learn from past experiences and that they aren't totally rational in their decision-making processes is a good way to design the organization for organizational learning, instead of considering employees are perfectly rational and able to respond optimally and instantaneously to changing conditions.

There are also some critical positions regarding organizational learning, as the following arguments. Organizations are not able to create knowledge, only individuals can (Lahti and Moilanen, 2004). In rigour, only individuals have the capability to create knowledge, but organizations are the context where learning occurs (Boerner *et al.*, 2003). But there are also some authors in support of the collective dimension of organizational learning. Organizational learning happens, by definition, in an organizational context, where the factors and conditions that model learning can be found (Antal *et al.*, 2003). Learning involves organizational and individual capabilities (Teece *et al.*, 1997). Learning and knowledge creation are activated, shaped and limited by the social constitution of the organizations where it occurs (Child and Heavens, 2003).

The structure of the roles, interests and powers of the different organizational elements generates paradoxes and tensions that origin dynamics impacting on the learning processes. These dynamics associated to the social identification of each organizational element uncover strong emotions. As a consequence, some times organizations do not learn from past relevant experiences, either successes or failures (Antal *et al.*, 2003). Successes and failures may, however, constitute factors that condition organizational learning (Starbuck and Hedberg, 2003) or the employees' emotions (Scherer and Tran, 2003). Considering the social dimension of learning is a good way to design the organization for organizational learning, instead of considering that learning is only individual and is not influenced by social elements. Organizational structure can be used to strengthen *Exploration* by undermining the effectiveness of *Exploitation*, like failures to recall past lessons, to implement past solutions, to communicate about current problems, all contribute to inefficiency in refining current practice.

In the structure there is an element dedicated to develop the organizational learning routines: the CKO – Chief Knowledge Officer (Graham and Pizzo, 1996; Lank, 1997; Demarest, 1997; Ruggles, 1998; Parker, 1998; Earl and Scott, 1999; Greco, 1999; Bonner, 2000; Mitchell and Bontis, 2000; Bontis, 2001b; Bontis, 2002a, Reinhardt *et al.*, 2003). It is up to this responsible (Warner and Witzel, 1999) to leader the “brain management” (Roberts, 2000) and the organizational learning systems (Bontis *et al.*, 2002). The CKO - Chief Knowledge Officer – focuses on the design of the organization and application of

knowledge (Burton and Obel, 2004). These professionals have very rich and different past organizational positions. Many come from information technology departments, human resources departments, or intellectual property areas, but they all have a strategic and multifunctional vision of the organization, that is superior to the specific area of specialization they were in. Generally speaking, we can find these positions of CKO's in centralised, top-down and big dimension structures, but they should also exist in any organization that proposes to develop knowledge management initiatives (Greco, 1999).

As a consequence of this, we are able to understand that the existence of a knowledge leadership and the human charisma of the CKO may have a role to play in the organizational design for knowledge management, but still there are some organizational factors the CKO has to face with. Albers and Jerke (2004) present, in a much systematised way, the organizational factors that have significant impact in knowledge management:

1. The organizational culture (the values reflected in shared behaviour and shared attitudes)
2. The organizational leadership (the actions, the words, the ethics and the examples that leaders set).
3. The organizational interest in organizational learning (the priority given to and the efforts made in support of the management of organizational learning)
4. The organizational knowledge processes (information and knowledge sharing mechanisms, tacit and explicit knowledge exchange, and organizational communication).
5. The organizational structure (the hierarchy, the groups, the geographic location and the work space distribution).
6. The organizational technological infrastructure (the hardware and software components used in the communication and in the collaboration between organizational members, and used in the storage, in the transfer, in the location, in the creation and in the integration of knowledge).

The existence of a CKO element in the firm's structure is a good way to design the organization for organizational learning, instead of considering that learning is an individual aspect of each employee which can not be managed by the firm.

### **Conclusions**

The variety of typologies, taxonomies and theories on organizational knowledge and organizational learning that are presented in the literature, reveals that there is a substantial scientific production on these themes, because of the relevancy researchers identify in them. There is a diversity of concepts, terminologies and definitions reflecting the embryonic state of the theme's theoretical edification; as a consequence, the development of academic studies that bring rigor to a clear relevant subject is needed. It is very interesting the relationship between these topics and organizational design. However, it can be still noticed some lack of cumulative theoretical and empirical development in a very particular field of research associating these topics.

The solidity of a desired and uniform theoretical body accepted by academia will be achieved through the persistence of researchers, combining theoretical deduction to the applied research. But there is still no common language or unifying paradigm that gathers all those researching in organizational knowledge and organizational learning, so there is the necessity to develop a largely accepted vocabulary able to unite researchers. As a consequence, the strategic theory of the knowledge-based view of the firm is confronted with the limitations and criticisms organizational knowledge and organizational learning still arouse.

Although there is much to be done, the impact of organizational learning on organizational design presents some very important characteristics:

- 1 - It seems reasonable to assume that in designing the organization for organizational learning it might be better to follow the organic design approach, characterized by low

formalization and centralization and high integration, instead of considering following the mechanistic design approach, characterized by low integration and high formalization and centralization.

2 - The integration and combination of knowledge is a good way to design the organization for organizational learning, instead of separating tasks and breaking the workflows of the knowledge-intensive operations.

3 - Organizational capabilities emerge over time through organizational learning processes. Knowledge intensive firms abandon formal structures and reach coordination through social reward and internal normative systems, instead of hierarchical control.

4 - Social reward and internal normative systems are a good way to design the organization for organizational learning, instead of formal hierarchy and structured incentives.

5 - A dynamic approach to social change is a good way to design the organization for organizational learning, allowing for new developments and diversification, instead of a passive view of business.

6 - Recognising that individuals are able to learn from past experiences and that they aren't totally rational in their decision-making processes is a good way to design the organization for organizational learning, instead of considering employees are perfectly rational and able to respond optimally and instantaneously to changing conditions.

7 - Considering the social dimension of learning is a good way to design the organization for organizational learning, instead of considering that learning is only individual and is not influenced by social elements.

8 - The existence of a CKO element in the firm's structure is a good way to design the organization for organizational learning, instead of considering that learning is an individual aspect of each employee which can not be managed by the firm.

## REFERENCES

- Albers, J. and Jerke, D. (2004) "Organizational Factors for an Effective Knowledge Management Environment", In Bart, Bontis and Head (Eds.) Conference Proceedings of the 25<sup>th</sup> McMaster World Congress, January 2004, Hamilton, Canada: MWC.
- Alvarez, S. and Busenitz, L. (2001) "The entrepreneurship of resource-based theory", [Journal of Management, 27, 755-775.](#)
- Ambler, T. and Styles, C. (2002) "Connecting Firm-Level Learning with Performance", Working Paper 01-191, Centre for Marketing, London Business School.
- Antal, A. and Krebsbach-Gnath, C. (2003) "Consultants as Agents of Organizational Learning: The Importance of Marginality" In Dierkes, Antal, Child and Nonaka (Eds.) [Handbook of Organizational Learning & Knowledge. Oxford: Oxford University Press, 462-486.](#)
- Antal, A., Dierkes, M., Child, J. and Nonaka, I. (2003) "Introduction. In Dierkes, Antal", Child and Nonaka (Eds.) [Handbook of Organizational Learning & Knowledge. Oxford: Oxford University Press, 1-13.](#)
- Argyris, C. (1998) "Teaching Smart People How to Learn", [Harvard Business Review on Knowledge Management. Boston, MA: Harvard Business School Publishing, 81-108.](#)
- Argyris, C. (2001) "Good Communication That Blocks Learning", [Harvard Business Review on Organizational Learning. Boston, MA: Harvard Business School Publishing, 87-109.](#)
- Argyris, C. and Schön, D. (1978) [Organizational Learning: A Theory of Action Perspective, Reading, MA: Addison-Wesley.](#)
- Barney, J. (2001a) "Is the resource-based "view" a useful perspective for strategic management research? Yes", [Academy of Management Review, 26 \(1\), 41-56.](#)
- Bierly III, P. and Daly, P. (2002) "Aligning Human Resource Management Practices and Knowledge Strategies: A Theoretical Framework", In Choo and Bontis (Eds.) [The Strategic](#)

Management of Intellectual Capital and Organizational Knowledge, New York: Oxford University Press, 277-295.

Blackler, F. (2002) "Knowledge, Knowledge Work, and Organizations: An Overview and Interpretation", In Choo and Bontis (Eds.) *The Strategic Management of Intellectual Capital and Organizational Knowledge*, New York: Oxford University Press, 47- 64.

Boerner, C., Macher, J. and Teece, D. (2003) "A Review and Assessment of Organizational Learning in Economic Theories", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 89-117.

Bonner, D. (2000) "[Enter the Chief Knowledge Officer](#)", *Training & Development*, February, 36-40.

Bontis, N. (2001b) "[CKO wanted – Evangelical skills necessary](#)", *Knowledge and Process Management*, 8 (1), 29-38.

Bontis, N. (2002a) "[The rising star of the Chief Knowledge Officer](#)", *Ivey Business Journal*, March/April, 20-25.

Bontis, N., Crossan, M. and Hulland, J. (2002) "[Managing Organizational Learning Systems by Aligning Stocks and Flows](#)", *Journal of Management Studies*, 39 (4), 437-469.

Buckley, P. and Carter, M. (2000) "[Knowledge Management in Global Technology Markets](#)", *Long Range Planning*, 33, 55-71.

Burns, T. and Stalker, G. (1961) *The management of innovation*. London: Tavistock.

Burton, R. and Obel, B. (2004) *Strategic Organizational Diagnosis and Design: The Dynamics of Fit – Third Edition*, Dordrecht, The Netherlands: Klumer Academic Publishers.

Child, J. (2003) "Learning through Strategic Alliances", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 657-680.

Child, J. and Heavens, S. (2003) "The Social Constitution of Organizations and its Implications for Organizational Learning", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 308-326.

Choo, C. (2002) "Sensemaking, Knowledge Creation, and Decision Making", In Choo and Bontis (Eds.) *The Strategic Management of Intellectual Capital and Organizational Knowledge*, New York: Oxford University Press, 79-88.

Cohen, W. and Levinthal, D. (1990) "[Absorptive Capacity: A New Perspective on Learning and Innovation](#)", *Administrative Science Quarterly*, 35 (1), 128-152.

Collis, D. (1991) "[A resource-based analysis of global competition: the case of bearings industry](#)", *Strategic Management Journal*, 12, 49-68.

Cook, S. and Yanow, D. (1995) "Culture and Organizational Learning", In Cohen and Sproull (Eds.) *Organizational Learning*, Thousand Oaks, CA: Sage Publications, 430-459

Croasdell, D., Jennex, M., Yu, Z., Christianson, T., Chakradeo, M. and Makdum, W. (2003) "[A Meta-Analysis of Methodologies for Research in Knowledge Management, Organizational Learning and Organizational Memory: Five Years at HICSS](#)", *Proceedings of the 36th Hawaii International Conference on System Sciences (HICSS'03)*, Hawaii, HI: HICSS.

Crossan, M., Lane, H. and White, R. (1997) "An Organizational learning framework: toward a theory", Working Paper, Richard Ivey School of Business, University of Western Ontario.

Crossan, M., Lane, H. and White, R. (1999) "[An Organizational learning framework: from intuition to institution](#)" *Academy of Management Review*, 24 (3), 522-537.

- Crossan, M. (2004) "Old wine in new bottles", Impact - Management Research in practice - an online monthly research publication by the Ivey Business School, (May), 8(4)
- Crossan, M. and Hulland, J. (2002) "Leveraging Knowledge through Leadership of Organizational Learning", In Choo and Bontis (Eds.) *The Strategic Management of Intellectual Capital and Organizational Knowledge*, New York: Oxford University Press, 711-723.
- Crossan, M. and Berdrow, I. (2003) "Organizational Learning and Strategic Renewal", *Strategic Management Journal*, 24, 1087-1105.
- Cyert, R. and March, J. (1963) *A Behavioral Theory of the Firm*. Englewood Cliffs, NJ: Prentice Hall.
- Czarniawska, B. (2003) "Anthropology and Organizational Learning", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 118-136.
- Demarest, M. (1997) "Understanding Knowledge Management", *Long Range Planning*, 30 (3), 374-384.
- DeNisi, A., Hitt, M. and Jackson, S. (2003) "The Knowledge-Based Approach to Sustainable Competitive Advantage", In Jackson, Hitt and DeNisi (Eds.) *Managing Knowledge for Sustained Competitive Advantage*, San Francisco: Jossey-Bass, pp. 3-33.
- Dess, G., Gupta, A., Hennart, J. and Hill, C. (1995) "Conducting and Integrating Strategy Research at the International, Corporate, and Business Levels: Issues and Directions", *Journal of Management*, 21 (3), 357-393.
- Drinkuth, A. Riegler, C. and Wolff, R. (2003) "Labor Unions as Learning Organizations and Learning Facilitators", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 446-461.
- Drucker, P. (1993) *Post-Capitalist Society*, New York: HarperCollins.
- Earl, M. and Scott, I. (1999) "What is a Chief Knowledge Officer?" *Sloan Management Review*, 40 (2), 29-38.
- Eriksen, J. (2005) "The influences of organizational design on strategy and performance – The case of exploration and exploitation", Paper presented at the Workshop on organizational design, EIASM-BRUSSELS, March 7-8.
- Fear, J. (2003) "Thinking Historically about Organizational Learning", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 162-191.
- Figueiredo, P. (2003) "Learning, capability accumulation and firms differences: evidence from latecomer steel", *Industrial and Corporate Change*, 12 (3), 607-643.
- Friedman, V. (2003) "The Individual as Agent of Organizational Learning", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 398-414.
- Garvin, D. A. (1998) "Building a learning organization", *Harvard Business Review on Knowledge Management*. Boston, MA: Harvard Business School Publishing, 47-80.
- Geus, A. (1988) "Planning as Learning", *Harvard Business Review*, March-April, 70-74.
- Graham, A. and Pizzo, V. (1996) "A Question of Balance: Case Studies in Strategic Knowledge Management" *European Management Journal*, 14 (4), 338-346.
- Greco, J. (1999) "Knowledge is Power", *Journal of Business Strategy*, March/April, 18-22.
- Griffith, T., Sawyer, J. and Neale, M. (2003) "Virtualness and Knowledge in Teams: Managing the Love Triangle of Organizations, Individuals, and Information Technology" *MIS Quarterly*, 27 (2), 265-287.
- Guthrie, J. (2001) "The management, measurement and the reporting of intellectual capital", *Journal of Intellectual Capital*, 2 (1), 27-41.

- Hitt, M., Bierman, L., Shimizu, K. and Kockhar, R. (2001a) "Direct and moderate effects of human capital on strategy and performance in professional service firms: a resource-based perspective", *Academy of Management Review*, 44 (1), 13-28.
- Huizing, A. and Bouman, W. (2002) "Knowledge and Learning Markets and Organizations", In Choo and Bontis (Eds.) *The Strategic Management of Intellectual Capital and Organizational Knowledge*, New York: Oxford University Press, 185-204.
- Ichijo, K. (2002) "Knowledge Exploitation and Knowledge Exploration: Two Strategies for Knowledge Creating Companies", In Choo and Bontis (Eds.) *The Strategic Management of Intellectual Capital and Organizational Knowledge*, New York: Oxford University Press, 477-483.
- Knott, A. (2002) "Exploration and Exploitation as Complements", In Choo and Bontis (Eds.) *The Strategic Management of Intellectual Capital and Organizational Knowledge*, New York: Oxford University Press, 339-358.
- Kogut, B. and Zander, U. (1996) "What Firms Do? Coordination, Identity, and Learning", *Organization Science*, 7 (5), 502-518.
- Lahti, S. and Moilanen, R. (2004) "Sharing of the tacit knowledge - a challenge of managing young and aging employees", Paper presented at the 19<sup>th</sup> Workshop on Strategic Human Resource Management, HEC-PARIS, April 22-23.
- Lane, C. (2003) "Organizational Learning in Supplier Networks", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 699-715.
- Lank, E. (1997) "Leveraging Invisible Assets: the Human Factor", *Long Range Planning*, 30 (3), 406-412.
- Lawrence, P. and Lorsch, J. (1967) *Organization and Environment*, Boston: Harvard Business School Press.
- Lei, D., Hitt, M. and Bettis, R. (1996) "Dynamic Core Competences through Meta-Learning and Strategic Context", *Journal of Management*, 22 (4), 549-569.
- Levinthal, D. and March, J. (1981) "A Model of Adaptive Organizational Search", *Journal of Economic Behavior and Organization*, 2, 307-333.
- Levitas, E. and Chi, T. (2002) "Rethinking Rouse and Daellenbach's Rethinking: Isolating vs. Testing for Sources of Sustainable Competitive Advantage", *Strategic Management Journal*, 23, 957-962.
- Levitt, B. and March, J. (1988) "Organizational learning", *Annual Review of Sociology*, 14, 319-340.
- Lovas, B. and Ghoshal, S. (2000) "Strategy as Guided Evolution", *Strategic Management Journal*, 21, 875-896.
- Lyles, M. (2003) "Organizational Learning in International Joint Ventures: The Case of Hungary", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 681-698.
- Maier, G., Prange, C. and Rosenstiel, L. (2003) "Psychological Perspectives of Organizational Learning", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 14-34.
- March, J. (1991) "Exploration and Exploitation in organizational learning", *Organization Science*, 2, 71-87.
- Marcharzina, K., Oesterle, M. and Brodel, D. (2003) "Learning in Multinationals", In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 631-656.
- Martin, X. and Salomon, R. (2003) "Tacitness, Learning, and International Expansion: A Study of Foreign Direct Investment in a Knowledge-Intensive Industry", *Organization Science*, 14 (3), 297-311.

- McEvily, S. and Chakravarthy, B. (2002) “The persistence of Knowledge-based Advantage: an Empirical Test for Product Performance and Technological Knowledge”, *Strategic Management Journal*, 23, 285-305.
- Miller, D. (1996) “A Preliminary Typology of Organizational Learning: Synthesizing the Literature”, *Journal of Management*, 22 (3), 485-505.
- Miller, K. (2002) “Knowledge Inventories and Managerial Myopia”, *Strategic Management Journal*, 23, 689-706.
- Miller, D. and Dröge, C. (1986) “Psychological and traditional determinants of structure”, *Administrative Science Quarterly*, 31(4), 539-560.
- Mintzberg, H. (1979) The structuring of organizations. Englewood-Cliffs, N.J.: Prentice Hall.
- Mintzberg, H., Ahlstrand, B. and Lampel, J. (1998) *Strategy Safari: A Guided Tour through the Wilds of Strategic Management*. New York: Free Press.
- Mitchell M. and Bontis, N. (2000) “Aligning Human Capital with Business Strategy: Foreign Bank and Luxury Retail”, In D. Bonner (Ed.), *Leading Knowledge Management and Learning*, Alexandria, VA: ASTD.
- Mouritsen, J., Larsen, H., Bukh, P. and Johansen, M. (2001) “Reading an intellectual capital statement – Describing and prescribing knowledge management strategies”, *Journal of Intellectual Capital*, 2 (2), 359-383.
- Nonaka, I. (1991) “The Knowledge-Creating Company”, *Harvard Business Review*, November-December, 96-104.
- Nonaka, I. (1994) “A Dynamic Theory of Organizational Knowledge Creation”, *Organization Science*, 5, 14-37.
- Nonaka, I. and Takeuchi, H. (1995) *The Knowledge Creating Company: How Japanese Companies Create the Dynamics of Innovation*, New York: Oxford University Press.
- Nonaka, I., Toyama, R. and Nagata, A. (2000) “A Firm as a Knowledge-creating Entity: A New Perspective on the Theory of the Firm”, *Industrial and Corporate Change*, 9 (1), 1-20.
- Nonaka, I. and Nishiguchi, T. (2001) *Knowledge Emergence: Social, Technical, and Evolutionary Dimensions of Knowledge Creation*, New York: Oxford University Press.
- Parker, D. (1998) “Towards IC reporting: Developing new measures”, *Australian CPA*, June, 24-25.
- Pawlowsky, P. (2003) “The Treatment of Organizational Learning in Management Science”, In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 62-88.
- Pisano, G. (2000) “In Search of Dynamic Capabilities: The Origins of R&D Competence in Biopharmaceuticals”, In Dosi, Nelson and Winter (Eds.) *The Nature and Dynamics of Organizational Capabilities*. Oxford, NY: Oxford University Press, 129-153.
- Polanyi, M. (1962) *Personal Knowledge: Toward a Post-critical Philosophy*. Chicago: University of Chicago Press.
- Prahalad, C. and Hamel, G. (1990) “The Core Competencies of the Corporation”, *Harvard Business Review*, May-June, 67-101.
- Reinhardt, R., Bornemann, M. Pawlowsky, P. and Schneider, U. (2003) “Intellectual Capital and Knowledge Management: Perspectives on Measuring Knowledge”, In Dierkes, Antal, Child and Nonaka (Eds.) *Handbook of Organizational Learning & Knowledge*. Oxford: Oxford University Press, 794-820.
- Roberts, B. (2000) “Pick Employees’ Brains”, *HR Magazine*, Feb., 115-120.
- Ruggles, R. (1998) “The State of the Notion: Knowledge Management in Practice”, *California Management Review*, 40 (3), 80-89.
- Rylander, A. and Peppard, J. (2004) “What is Really a Knowledge Intensive Firm? An Analysis of the Dependent Variable”, In Bart, Bontis and Head (Eds.) *Conference*

- Proceedings of the 25<sup>th</sup> McMaster World Congress, Janeiro de 2004, Hamilton, Canada: MWC.
- Sadler, P. (2003) "Leadership and Organizational Learning", In Dierkes, Antal, Child and Nonaka (Eds.) Handbook of Organizational Learning & Knowledge. Oxford: Oxford University Press, 415-427.
- Scherer, K. and Tran, V. (2003) "Effects of Emotion on the Process of Organizational Learning", In Dierkes, Antal, Child and Nonaka (Eds.) Handbook of Organizational Learning & Knowledge. Oxford: Oxford University Press, 369-392.
- Senge, P. (1990) The Fifth Discipline – The Art and Practice of The Learning Organization. New York: Doublebay.
- Spender, J. 2002. "Knowledge, Uncertainty and an Emergency Theory of the Firm", In Choo and Bontis (Eds.) The Strategic Management of Intellectual Capital and Organizational Knowledge, New York: Oxford University Press, 149-162.
- Saint-Onge, H. and Armstrong, C. (2004) The Conductive Organization, Burlington, MA: Elsevier Butterworth-Heinemann.
- Starbuck, W. (1992) "Learning by knowledge intensive firms", Journal of Management Studies, 29 (6), 713-740.
- Starbuck, W. and Hedberg, B. (2003) "How Organizations Learn from Success and Failure", In Dierkes, Antal, Child and Nonaka (Eds.) Handbook of Organizational Learning & Knowledge. Oxford: Oxford University Press, 327-350.
- Sveiby, K. (1996) "Transfer of Knowledge and the Information Processing Professions", European Management Journal, 14 (4), 379-388.
- Sveiby, K. (1997) The New Organizational Wealth, San Franscisco: Berrett-Koehler Publishers.
- Szulanski, G. (2003) Sticky Knowledge – barriers to knowing in the firm. London: Sage Publicatios Ltd.
- Tainio, R., Lilja, K. and Santalainen, T. (2003) "The Role of Boards in facilitating or Limiting Learning in Organizations", In Dierkes, Antal, Child and Nonaka (Eds.) Handbook of Organizational Learning & Knowledge. Oxford: Oxford University Press, 428-445.
- Tallman, S. (2001) "Global Strategic Management", In M. Hitt, R. Freeman and J. Harrison (Eds.) Handbook of Strategic Management. Malden, MA: Blackwell.
- Teece, D., Pisano, G. and Shuen, A. (1997) "Dynamic capabilities and strategic management", Strategic Management Journal, 18 (7), 509-534.
- Tetrick, L. and Da Silva, N. (2003) "Assessing the Culture and Climate for Organizational Learning", In Jackson, Hitt and DeNisi (Eds.) Managing Knowledge for Sustained Competitive Advantage, San Francisco: Jossey-Bass, pp. 333-359.
- Umemoto, K. (2002) "Managing Existing Knowledge Is Not Enough", In Choo and Bontis (Eds.) The Strategic Management of Intellectual Capital and Organizational Knowledge, New York: Oxford University Press, 463-476.
- Volberda, H. (1996) "Toward the flexible form: how to remain vital in the hypercompetitive environments", Organization Science, 7, 359-374.
- Warner, M. and Witzel, M. (1999) "The Virtual General Manager", Journal of General Management, 24 (4), 71-92.
- Weber, C. and Antal, A. (2003) "The Role of Time in Organizational Learning", In Dierkes, Antal, Child and Nonaka (Eds.) Handbook of Organizational Learning & Knowledge. Oxford: Oxford University Press, 351-368.
- Winter, S. (1987) "Knowledge and competence as strategic assets", In D. Teece (Ed.) The Competitive Challenge: Strategies of Industrial Innovation and Renewal. Cambridge, MA: Ballinger, 159-184.

Zack, M. (2002) “Developing a Knowledge Strategy”, In Choo and Bontis (Eds.) *The Strategic Management of Intellectual Capital and Organizational Knowledge*, New York: Oxford University Press, 255-276.

<b>Table I. Summary of key organizational design variables</b>	
Mechanistic design	Organic design
<i>High formalization</i> Extensive use of written procedures High degree of task specialization Strict performance control	<i>Low formalization</i> Little use of written procedures and Low degree of task specialization Relaxed performance control
<i>Low integration</i> Little use of liaison processes Little use of liaison structures	<i>High integration</i> Extensive use of liaison processes Extensive use of liaison structures
<i>High centralization</i> Little delegation of decision making authority	<i>Low centralization</i> Extensive delegation of decision making authority

Adapted from Miller and Dröge (1986)