

ORGANIZATIONAL LEARNING, KNOWLEDGE MANAGEMENT, AND INTELLECTUAL CAPITAL: AN INTEGRATIVE CONCEPTUAL MODEL

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ABSTRACT

The literature and the practice about knowledge in organizations is characterized by the use of very diverse terminology, where concepts such as organizational learning (OL), knowledge management (KM), and intellectual capital (IC) are often employed but rarely discussed together. Recognizing that no single overarching framework has been proposed to clear up this conceptual confusion, this paper provides a model that integrates OL, KM, and IC and that establishes a theoretical link between these constructs and performance. Our integrative model synthesizes what we know about OL, KM, and IC, acknowledges their distinct roots, draws the boundaries of each field's domain, and identifies their relationships and impact on firm performance. We propose this model as an instrument to facilitate communication between researchers working on various facets of the learning phenomenon.

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“Organizational learning”, “knowledge management”, and “intellectual capital” are terms commonly used in today’s business environment and usually associated with large-budget projects pursued by firms convinced that the only competitive advantage the company of the future will have is its ability to learn faster than its competitors (DeGeus, 1988). Although early discussions about these concepts date to the 1960s (Cangelosi & Dill, 1965; Galbraith, 1967; Polanyi, 1967), it was not until the 1990s that these topics dramatically captured the attention of managers, when Senge (1990) popularized the concept of the “learning organization” and Nonaka and Takeuchi (1995) described how to become a “knowledge-creating company”. It was also in the 1990s, when Skandia provided the first example of reporting intellectual capital to shareholders and the evolution of the Internet and information technology allowed the development of sophisticated knowledge management tools. By the end of the 20th century, estimates held that around 20 percent of Fortune 500 companies had created and filled positions called “Chief Learning Officer”, “Chief Knowledge Officer”, or “Director of Intellectual Capital” in an effort to formalize their commitment to learning (Stuller, 1998).

But, while consultants provide learning solutions to managers, academics (Crossan, Lane, White, & Djurfeldt, 1995; Fiol & Lyles, 1985; Huber, 1991; Simon, 1991; Weick, 1991) have expressed their concern about the lack of consistent terminology, cumulative work, and a widely accepted framework of the learning field. Miner and Mezias (1996) even called the organizational learning theory “an ugly duckling in the pond of organizational theory: interesting, but living on the fringes” (1996: 88). Furthermore, although organizational learning (OL), knowledge management (KM), and intellectual capital (IC) are closely interrelated, they are rarely discussed together. The motivation for this paper comes from the recognition that too many terms have been created to describe and prescribe learning and knowledge in firms and that no single overarching framework has been presented to clear up this conceptual confusion.

The purpose of this paper is to provide a conceptual model that integrates OL, KM, and IC and establishes a theoretical link between these constructs and performance. Our research questions are: (1) *How do OL, KM, and IC fit together?* and (2) *How do they impact performance?* To answer these questions, it is first necessary to define the three constructs, acknowledging their distinct roots, and to establish their domains and their boundaries. From this analysis, connections between OL, KM, and IC will emerge.

The structure of this paper is the following. First, the OL, KM, and IC literatures are reviewed, compared, and contrasted. Second, a framework of the integration of OL, KM, and IC and their link to performance is offered. Finally, conclusions and directions for future research are included.

1. COMPARISON TOWARDS INTEGRATION

We start this section by defining the constructs discussed in the three fields. Then, we compare and contrast the OL, KM, and IC literatures in terms of their levels of analysis and their emphasis on cognition and behavior. These two dimensions have been mentioned

as part of the “assumption set” from which most researchers in the learning field frame their definitions and concepts (Crossan et al., 1995). Finally, we draw the boundaries of the three fields’ domains.

1.1. Definition of Constructs

Efforts to distinguish the fields of organizational learning, knowledge management, and intellectual capital are rare. The language becomes confusing when authors such as Nonaka and Takeuchi (1995) insist that organizational learning and the knowledge creation process are different concepts. There is also confusion in discussions about the difference between knowledge and intellectual capital and between knowledge management and intellectual capital management. For some authors, IC is knowledge (Bontis, 1998; Edvinsson & Malone, 1997; Nahapiet & Ghoshal, 1998), while for others, IC is much more than knowledge (Brooking, 1996; Edvinsson & Sullivan, 1996; Roos, Roos, Dragonetti, & Edvinsson, 1997). Also, while researchers in each field often fail to acknowledge the other - as when researchers in organizational learning exclude the term “knowledge” from their studies and researchers in knowledge management do the same with the term “learning” - other researchers use the terms learning, knowledge, and intellectual capital interchangeably.

In defining our first construct, *organizational learning*, we agree with the growing group of theorists (Argyris & Schoen, 1978; Duncan & Weiss, 1979; Miller, 1996), who emphasize the interrelationship between cognition and behavior and conclude that the learning process encompasses both cognitive and behavioral change. Individuals and groups learn by understanding and then acting or by acting and then interpreting (Crossan et al., 1995). The definition of OL adopted for this paper incorporates this thinking: "organizational learning is the process of change in individual and shared thought and action, which is affected by and embedded in the institutions of the organization" (Crossan, Lane, & White, 1998): 4). When individual and group learning becomes institutionalized, organizational learning occurs and knowledge is embedded in non-human repositories such as routines, systems, structures, culture, and strategy (Crossan, Lane, & White, 1999; Nelson & Winter, 1982; Walsh & Rivera, 1991). Because of its intrinsic notion of change, organizational learning research has dealt with questions of how organizations evolve, transform (e.g., Barnett, Greve, & Park, 1994; MacIntosh, 1999), and renew themselves (e.g., Crossan et al., 1999; Lant & Mezias, 1992; Mezias & Glynn, 1993) in order to face the challenges of a continuously changing environment.

Moving to our second construct, *knowledge management*, we see this literature as divided in several branches. One significant branch of academic work has been interested in studying *organizational knowledge* as a firm resource and a source of competitive advantage and is rooted in research on the resource-based view of the firm (Barney, 1991; Penrose, 1959). Several authors argue for a “knowledge-based theory of the firm” as a theory that explains the organizational advantage of firms over markets (Ghoshal & Moran, 1996; Grant, 1996; Kogut & Zander, 1992).

To develop a theory where the creation, transfer, and application of knowledge is the reason why firms exist, researchers have engaged in a passionate debate about what knowledge is and what forms or types of it are available (Collins, 1993; Von Krogh, Roos,

& Slocum, 1994). Whereas the term learning has not been bound up in questions of veridicality and accuracy, the term knowledge has witnessed many debates. For positivists, knowledge (“justified true belief”) is universal and the result of systematic analysis of experience in a knowable reality (Spender, 1996). The positivist view of knowledge is the predominant one in Western culture and a generally accepted assumption in organizational theory (Nonaka & Takeuchi, 1995). However, followers of Kant, for example, reject this view and assert that reality will be forever unknowable, because knowledge is constructed from sense impressions, and cannot tell us anything about reality beyond these impressions (Spender, 1996). Positivist views of knowledge are increasingly being challenged by more constructivist, relativist, and empiricists perspectives that shift the notion of *knowledge* as a commodity that individuals or organizations may acquire, to the study of *knowing* as something that they do (Cook & Brown, 1999; Polanyi, 1967). Polanyi’s (1967) work, in particular, has been highly influential in defining knowledge as dynamic, when he argues that knowledge is an activity which could be better described as a process of knowing. Several researchers (Blackler, 1993, 1995; Blackler, Reed, & Whitaker, 1993; Polanyi, 1967; Spender, 1994; Spender & Grant, 1996; Spender, 1996; Tsoukas, 1996) have tried to overcome the mind-body dualism, arguing that knowledge cannot be conceived independently from action, and that humans might be able to know in two ways, one based on the exercise of reason (mind), and the other based on experience (body).

We see the concepts of knowing, knowledge, and learning as closely intertwined. We summarize these relationships in Figure 1. First, knowledge can be obtained through the mind (learning by reflection, anticipatory learning) and through the body (learning by doing, experimental learning). Second, knowledge can be accumulated in our minds (knowing what, theoretical knowledge, declarative knowledge) and also in our bodies (knowing how, practical knowledge, procedural knowledge). Last, learning is the change in knowledge and the change in knowing, which involves, as mentioned before, changes in cognition and changes in behavior. Knowledge and knowing are the content of the learning process, in other words, what we learn or get to know. The main distinction between knowledge and knowing is that knowledge is mainly cognitive, including the facts and capabilities we know, while knowing is mainly behavioral, or the expression of knowledge in action.

Insert Figure 1 about here

In addition to the efforts towards understanding what knowledge is and how it can become a source of sustainable competitive advantage, another branch of the knowledge management literature studies the processes through which knowledge is developed, retained, and transferred (e.g., Almeida, 1996; Argote & Ingram, 2000; Hoopes & Postrel, 1999; Pisano, 1994; Szulanski, 1996). Thus, this second branch of research steps back from the questions about knowledge types and forms and emphasizes the need to understand the micro-processes by which knowledge is created or acquired, communicated, applied, and utilized in organizations. Similarly, we detect a growing interest in studying the alignment between the firm’s knowledge and its strategy, structure, environment, and leadership (e.g., Bierly & Chakrabarti, 1996; Davenport & Prusak, 1998; Hedlund, 1994; Leonard, 1995; Sanchez, 1996; Zack, 1999).

One aspect in which the KM literature can learn from the evolution of the OL field is in terms of differentiating descriptive and prescriptive work. While the OL literature has cleared up the confusion between the concepts of “organizational learning” and “learning organization” (LO) by realizing that academics use the first term in a descriptive way, while practitioners use the second term in a prescriptive one, knowledge management still means different things to different communities. When providing prescriptions, consultants talk about the need to proactively manage knowledge and define knowledge management as “managed learning”. In these discussions, KM is defined as “the explicit control and management of knowledge within an organization aimed at achieving the company’s objectives” (Van der Spek & Spijkervet, 1997: 43) and “the ability of organizations to manage, store, value, and distribute knowledge” (Liebowitz & Wilcox, 1997: i). In addition, technology specialists prescribe KM as heavily leveraged on information technology and discuss the implementation of KM tools such as intranets, datawarehousing/knowledge repositories, electronic document systems, yellow pages catalogs, best practices/lessons databases, groupware, and decision support systems (Hansen, Nohria, & Tierney, 1999; Ruggles, 1998).

Moving to our third construct, *intellectual capital*, the roots of this term are found in the economics field, but the label became popular when Skandia, Dow Chemicals, and the Canadian Imperial Bank of Commerce started to use it to denominate all their intangible firm resources (Stewart, 1994). In particular, important differences between the book and market value of firms in the service industry prompted managerial interest in measures that could capture the invisible side of companies. The importance of this effort was that “what you measure is what you can manage”.

In defining IC, consensus is far from achieved. To compensate for the lack of agreement about a definition, several authors have suggested IC classifications to describe the components included in the concept (Bontis, 1998; Brooking, 1996; Edvinsson & Malone, 1997; Roos et al., 1997; Saint Onge, 1996; Sveiby, 1997). Most of the models assume a “three-way distinction” (Ross et al., 1997) between human capital, an internal structure of capital (structural capital), and an external structure of capital (relationship capital). However, the models differ in the names and levels of aggregation used to identify the IC components. Most important, authors disagree about the presence of tacit and explicit knowledge in IC. While for Bontis (1998) and Saint Onge (1996) IC is mainly composed of tacit knowledge, Ross et al. (1997) and Sveiby (1997) see the contributions of tacit and explicit knowledge as balanced. Another disagreement is about the inclusion of intellectual property as part of IC (Bontis, 1998; Ross et al., 1997).

One puzzling contradiction in the literature is the idea that IC and knowledge are equivalent concepts versus the idea that IC is much more than knowledge. For those scholars that view IC as more than knowledge, IC contains all non-financial, intangible organizational assets and represents the total hidden gap between market value and book value, commonly known as “goodwill”. These authors mention brand reputation and customer loyalty as IC components that are not knowledge. We do not agree with this argumentation. In his categorization of intangible resources, Hall (1992) describes reputation as “knowledge and emotions held by individuals about, say, a product range” (1992: 138) and Bontis (1998) explains relationship capital as knowledge embedded in links external to the firm (e.g. customers) that can be measured as a function of longevity. We conclude that the four categories of intangible resources presented by Hall (1992) -

functional, cultural, positional, and regulatory - are built on the concept of knowledge and agree with authors who define IC as “the knowledge and knowing capability of a social community” (Nahapiet & Ghoshal, 1998: 245) and “knowledge that can be converted into value” (Edvinsson & Sullivan, 1996). According to this definition, IC contains human knowledge as well as the knowledge embedded in the organization’s structures, processes, routines, systems, culture, intellectual property, and relationships with external stakeholders.

Finally, there have been initial discussions about a hybrid concept called *intellectual capital management (ICM)*. Trying to differentiate ICM from KM, IC scholars position KM at the operational level and ICM at the strategic level. For example, Wiig (1997) argues that ICM focuses on building and governing intellectual assets from strategic and enterprise governance perspectives with some focus on tactics, while KM has a tactical and operational perspective and provides the tools that support the implementation of ICM. Edvinsson (1997) adds that the goal of KM is to improve the company’s value creation capability through the more effective use of knowledge and human capital in particular, while the goal of ICM is both value creation and value extraction (e.g. intellectual properties and commercializable intangible assets). On the other side of the discussion, KM researchers (Davenport, De Long, & Beers, 1998; Hansen et al., 1999; Van der Spek & Spijkervet, 1997; Zack, 1999) include in KM both a strategic and a tactical perspective of knowledge-processes in organizations. Consistent with our definition of knowledge and IC as equivalent concepts, we do not see the need to differentiate between KM and ICM. For us, knowledge/IC management includes strategic and tactic efforts to formulate and implement a knowledge strategy aligned with the firm objectives. At the strategic level, knowledge/IC management sets forth the criteria for choosing what knowledge a firm needs to pursue, and how it will go about capturing and sharing it. At the tactic level, knowledge/IC management is about the processes or flows through which knowledge is physically captured, transferred, integrated, applied, etc.

From this initial analysis of the constructs, we conclude that while our three fields of interest recognize the importance of learning and knowledge/knowing in organizations, they emphasize different aspects of the phenomenon. OL focuses on learning as a process of change, KM stresses knowledge as a resource towards competitive advantage and studies the processes associated with it, and IC’s goal is to measure the value of intangibles and to leverage them. Another distinction between the areas is that while OL and KM have academic traditions, IC is considered very much a practitioner-created concept (Bontis, Dragonetti, Jacobsen, & Roos, 1999). Nevertheless, managers consider both KM and IC more tangible concepts than OL, because they associate them with information technology solutions and accounting practices.

1.2. Levels of analysis

In this section, we discuss the levels of analysis associated with the OL, KM, and IC concepts. Several authors (Crossan et al., 1999; Kogut & Zander, 1992; Nonaka & Takeuchi, 1995) in the OL and KM fields have proposed that learning occurs and that knowledge exists at the individual, group, organizational, and inter-organizational or network levels. This fourth level of analysis has attracted a lot of attention from researchers interested in the role of learning in alliances, joint ventures, strategic groups, and inter-firm

relationships in general (e.g., Doz, 1996; Dussauge, 2000; Inkpen & Crossan, 1995; Khanna, 1998; Kogut, 1988). However, other scholars associate OL and KM with only the individual level or with a specific subset of these four levels.

The debate in the literature mostly focuses on the organizational level, because of concerns about anthropomorphism. On one side, Simon (1991) states that “all learning takes place inside individual human heads; an organization learns in only two ways: (a) by the learning of its members; or (b) by ingesting new members who have knowledge the organization didn’t previously have” (1991: 176). On the other side, Hedberg (1981) argues that “although organizational learning occurs through individuals, it would be a mistake to conclude that organizational learning is nothing but the cumulative result of their members’ learning ... Members come and go, and leadership changes, but organizations’ memories preserve certain behaviors, mental maps, norms and values over time” (1981: 6). Furthermore, work by Nelson and Winter (1982) describes knowledge at the organizational level and refers to organizational routines as the organization’s genetic material, some explicit in bureaucratic rules, some implicit in the organization’s culture. We agree with this second growing group of scholars that organizations are more than the sum of individuals and that by acknowledging the existence of non-human repositories of knowledge and organizational learning systems (Shrivastava & Grant, 1985), the capacity to learn, to know, and to have a memory (Walsh & Rivera, 1991) can be attributed to firms.

In contrast to the OL and KM literatures, the IC literature has not explicitly addressed its assumptions about levels of analysis. However, it is possible to relate Kogut and Zander’s (1992) levels of knowledge to the classification of IC assets in human, structural, and relationship capital and to establish a parallelism between individual and group knowledge and human capital; organizational knowledge and structural capital; and network knowledge and relationship capital. Furthermore, when proposing the concept of “intellect”, Quinn (1998) argues that it encompasses cognitive knowledge (know what), advanced skills (know how), system understanding (know why), motivated creativity (care why), and synthesis and trained intuition (perceive how and why). He mentions that although intellect resides in the brains of professionals, the first three levels can also exist in the organization’s systems, databases, or operating technologies, whereas the fourth is often found in its culture.

In conclusion, there is general agreement between OL, KM, and IC scholars that individuals, groups, organizations, and networks can learn, know (have knowledge), and accumulate IC. Once the different levels of analysis are recognized, the next step is to provide a theory that links the levels and that explains the micro-processes by which learning and knowledge and one level become learning and knowledge at another level. In this sense, Crossan et al.’s (1999) and Spender’s (1994, 1996) work are perhaps the most ambitious efforts to date to provide a multilevel theory of OL and KM.

1.3. Cognition and behavior

In this section, we discuss how the OL, KM, and IC fields establish the link between cognition and behavior and provide an answer to the question: Are learning, knowledge, and IC associated with a change in cognition or knowledge acquisition, with behavior or observable action-taking, with both, or with none?

As mentioned earlier, OL has been associated with changes in cognition and/or changes in behavior and there is a growing agreement in the literature that for learning to occur these two processes must be included. In the case of the KM literature, it discusses knowledge and knowing as grounded in action and as processes that requires both cognitive and physical activity. Furthermore, constructivist approaches to knowledge emphasize that knowledge is constructed in interaction with the world, that knowledge is situated in practices, and that knowledge is relational, mediated by artifacts, contextualized, and dynamic (Blackler, 1995).

Finally, while the IC field is mostly focus on cognition, with continuous references to the need to accumulate intellectual capital, it also starts to stress more explicitly its link to behavior. For example, Roos (1998) mentions that “the purpose of an IC approach is to change people’s behavior, not least through changing the corporate language” (1998: 151). The behavioral aspect of IC is also implicit in the notion of “value extraction” (Edvinsson, 1997; Edvinsson & Sullivan, 1996), which emphasizes that a firm must take action based on the IC that has accumulated. In fact, IC researchers and practitioners are specially interested in actions towards obtaining a financial return on intellectual assets.

In conclusion, although the OL field has been the most explicit one in explaining the cognition and behavioral aspects of the learning phenomenon, the KM and IC fields do not only focus on cognition, but also on the action-orientation and utilization of the knowledge acquired and the IC accumulated.

1.4. Definition of Boundaries

Figure 2 summarizes our view about the domains and boundaries of the OL, KM, and IC fields.

Insert Figure 2 about here

In Figure 2, we show OL and KM as overlapping fields of research, but we recognize that there are topics that are dealt mostly in one of the two fields and topics in which one field is more advanced in its thinking than the other one is. For example, we see OL as the most advanced in terms of providing a multilevel theory of learning in organizations. We also recognize OL as the field proposing the notion of an OL system or infrastructure where organizational level storehouses of knowledge - strategy, structure, systems, culture, and procedures - are aligned. In contrast, we see the KM field as the one focused on creating a knowledge-based view of the firm, where the creation and integration of knowledge is the reason why firms exist. Finally, we present IC as mainly incorporated in the knowledge management concept, although what differentiates it from the other two fields is its emphasis in providing prescriptions about the measurement and reporting of intangible assets. The following points summarize our observations from Figure 2:

1. One difference between OL and KM is that where KM is mainly centered on understanding the nature of knowledge and knowing as an asset or a stock, OL primarily emphasizes the processes through which knowledge and knowing change or

flow. That is, there is a distinction between studying *what* is learned and studying the *process* of learning (Schendel, 1996).

2. KM and IC share their representation of knowledge as a firm resource that can lead to sustainable competitive advantage. Thus, we position the knowledge-base view of the firm in Figure 2 within the boundaries of the KM domain. In KM and IC, the unit of analysis is mainly the stock of knowledge or the intellectual asset. Consequently, there is a lot of discussion on trying to understand what knowledge is, on defining knowledge typologies, and on contrasting knowledge to concepts such as data and information. In contrast, in the OL literature, the unit of analysis is mainly the flow of knowledge or the process through which knowledge changes. KM and IC share a more static view of knowledge, while OL is primarily interested in the changes in knowledge.
3. However, although we made a distinction between the study of static knowledge (KM and IC) and the study of how knowledge changes (OL), we show in Figure 2 that the three fields start to overlap, because new research lines in KM (e.g. knowledge conversion and knowledge development processes) and IC (e.g. flows of IC stocks) look at the evolution of knowledge over time.
4. OL and KM also overlap, because learning has been increasingly defined in terms of knowledge processes. For example, Argote (1999) defines learning as “knowledge acquisition” and mentions that learning involves the processes through which members share, generate, evaluate, and combine knowledge. In addition, knowledge is not viewed as purely cognitive anymore. Both OL and KM incorporate cognitive and behavioral aspects of learning and knowledge. Thus, when the notion of static knowledge is replaced by dynamic knowing and the agenda switches from managing knowledge assets to studying the knowledge-associated processes, such as creation, retention, and transfer, there is a powerful opportunity to unify the insights from both the organizational learning and knowledge management communities.
5. OL and KM share the recognition that learning and knowing are situated in practices. This research includes the study of community of practices (Brown & Duguid, 1991) and activity systems (Blackler, 1995; Spender, 1996). The fundamental idea is that it is impossible to separate learning from working (Brown & Duguid, 1991) and that knowledge exists in socially-distributed activity systems, where participants employ their situated knowledge in a situation which is itself constantly developing. In response to this changing situation participants learn, that is, their knowledge and behavior will also inevitably develop (Blackler, 1995).
6. OL is more advanced than KM and IC in terms of providing a multilevel theory of how learning occurs at the individual, group, and organizational levels, how learning at one level impacts learning at other levels, and how knowledge flows from one level to the others (e.g., Crossan et al., 1999). Although KM researchers talk about knowledge at different levels of analysis, more work is needed to describe the micro-processes that link the levels. For example, Spender (1994, 1996) has integrated the tacit and explicit taxonomy with the individual and social levels of analysis to present a matrix of four types of organizational knowledge: conscious, automatic or non-conscious, objectified or scientific, and collective. Then, he has discussed the “action-domains” of each of the four types of knowledge and described learning as the conversion from one type of

knowledge to another. Still, the cognitive and behavioral processes involved in these learning flows need to be identified in order to provide useful prescriptions to firms.

7. In order to develop a multilevel theory of knowledge in organizations, KM also needs to establish relationships between the different knowledge-associated processes at different levels. For example what for one individual is knowledge sharing may be knowledge acquisition (learning) for a group, or what for one individual is knowledge creation (learning) may be knowledge access for a group. In addition, when, for example, knowledge transfer process is discussed at the group level, what is viewed as a transfer of current knowledge in the eyes of the sender may be seen as the acquisition of new knowledge in the eyes of the receiver. These examples show that OL and KM involve many knowledge processes and that there are huge opportunities for the two fields to work together to build a theory that relates one process to the others, at different levels of analysis.
8. We propose in Figure 2 that the OL literature is the one that has most explicitly discussed the development of a learning system or infrastructure, which consists of embedded learning in the strategy, structure, culture, systems, and procedures of the firm. This learning infrastructure affects and is affected by learning processes and the different elements of the systems need to be aligned with each other for the firm to be successful.
9. Finally, each of the three fields has a component of prescriptive literature. In the case of IC, most of the literature is prescriptive and there is necessity to engage in more theory development and testing in order to legitimize the field in the academic community. In the case of KM, it has strong academic roots, but still needs to clear up the conceptual confusion between descriptive and prescriptive work. In doing this, KM can benefit from the evolution of the OL and LO perspectives of learning.

Building on the conclusions from this initial review, the following section presents a conceptual model that integrates the learning, knowledge, and intellectual capital constructs to firm performance.

2. INTEGRATIVE MODEL

Figure 3 presents the integrative model of organizational learning, knowledge management, intellectual capital, and performance. We understand by performance the organization's success or failure in achieving its goals. Organizational goals include financial and non-financial (e.g. quality, reputation, growth). In the following sections, the propositions included in the model are discussed.

Insert Figure 3 about here

2.1. The circular relationship between learning and knowledge/IC

In the model in Figure 3, we show learning and knowledge/IC intertwined in an iterative process. While learning produces new knowledge, knowledge impacts future learning.

Two theories, in particular, clearly differentiate between learning processes and learning content or objects: Nonaka and Takeuchi's (1995) knowledge spiral and Crossan et al.'s (1999) 4Is framework of OL. Using the distinction between tacit and explicit knowledge, Nonaka and Takeuchi (1995) suggest four basic modes of knowledge creation - socialization, externalization, internalization, and combination - and four contents of knowledge created by the four modes: sympathized knowledge, conceptual knowledge, operational knowledge, and systemic knowledge. Mintzberg, Ahlstrand, and Lampel (1998) summarize these “four modes of knowledge conversion”:

Socialization describes the implicit sharing of tacit knowledge, often even without the use of language - for example, through experience ... *Externalization* converts tacit to explicit knowledge, often through the use of metaphors and analysis - special uses of language. *Combination* combines and passes formally codified knowledge from one person to another... *Internalization* takes explicit knowledge back to the tacit form, as people internalize it, as in “learning by doing”. Learning must therefore take place with the body as in the mind. (1998:211)

Crossan (1991) also describes the inputs and outputs of the organizational learning process. For her, the process of OL can be conceived as a dynamic interplay among the organization belief system, the behaviors of its members, and stimuli from the environment, where beliefs and behaviors are both an input and a product of the process as they undergo change. In their 4Is framework of OL, Crossan et al. (1999) argue that learning takes place on the individual, group, and organizational levels, and that four sub-processes link the three levels, involving both behavioral and cognitive changes. Mintzberg et al. (1998) summarize the four sub-processes embedded in the 4I framework:

Intuiting is a subconscious process that occurs at the level of the individual. It is the start of learning and must happen in a single mind. *Interpreting* then picks up on the conscious elements of this individual learning and shares it at the group level. *Integrating* follows to change collective understanding at the group level and bridges to the level of the whole organization. Finally, *institutionalizing* incorporates that learning across the organization by imbedding it in its systems, structures, routines, and practices. (1998: 212)

To describe the relationship between learning, knowledge, and IC, the concepts of flows and stocks have been frequently used (Appleyard, 1996; Bontis, Crossan, & Hulland, 2001; Decarolis & Deeds, 1999). These metaphors were introduced by researchers of the resource-based view of the firm (Itami, 1987). In the KM literature, Spender (1994) talks about the “flow of learning” to describe the conversion of automatic knowledge to collective knowledge and of collective knowledge to objectified knowledge. Furthermore, Bontis et al. (2001) operationalize the 4I framework of OL in the form of the Strategic Learning Assessment Map (SLAM) and introduce the terms “stocks of knowledge” and “flows of knowledge”. They differentiate between knowledge that is static and resides at

the individual, group, and organizational levels, and knowledge that is dynamic and moves across levels. There are two flows of knowledge, the feed-forward from the individual and group to the organization - representing the four sub-processes of learning: intuiting, interpreting, integrating, and institutionalizing - and the feedback from the organization to the individual and group. Knowledge stocks and flows interact with one another in a comprehensive organizational learning system and need to be aligned with each other (Bontis et al., 2001). Using other terminology, Bontis (1998) has also described the management of organizational knowledge as encompassing two distinct but related phenomena: “organizational learning flows” and “intellectual capital stocks”.

Although mainly focused on the concept of assets or stocks, the IC literature has also incorporated the notion of flows. Using an accounting analogy, several researchers (Bontis et al., 1999; Edvinsson, 1997; Edvinsson & Sullivan, 1996; Roos & Roos, 1997; Roos et al., 1997) argue that it is not only necessary to have a balance sheet of IC stocks, but also an income statement of the changes in these stocks. However, there is no consistency in the field among definitions of IC flows. Bontis et al. (1999) call flows the changes in the stocks of intangible resources and Roos et al. (1997) define flows of capital as “the transformation of intellectual capital into financial capital and viceversa, and the internal flows of intellectual capital” (1997: 52). An example of an IC flow is a marketing campaign, where financial capital is transformed into structural capital, which is expected to lead to relationship capital and back to financial capital. Edvinsson (1997) mentions that for Skandia, a key role of leadership is the transformation of human capital into structural capital, since human capital cannot be owned by the company, it can only be rented, while structural capital can be owned and traded by the firm. Furthermore, he adds that the flow of IC from human capital to intellectual property allows firms to commercialize these assets. From these examples we can see that the notion of flows in the IC literature is somehow related to the “knowledge conversion” process mentioned in the KM literature (Nonaka & Takeuchi, 1995; Spender, 1994, 1995), which in turn can be equated to the concept of institutionalized learning in the OL literature (Crossan et al., 1999).

In our model, we use the stock metaphor to identify our knowledge/IC construct, which includes all the human and non-human repositories of knowledge in the organization. Then, we apply the flow metaphor to our learning construct, where the flow of learning represents the different processes that take place at different levels so that new knowledge is created and institutionalized. We also assert in our model that both the knowledge/IC stocks and the learning flows have cognitive and behavioral dimensions. Miller (1996) summarizes the link between learning, knowledge, and action when he states that “organizational learning is the acquisition of new knowledge by actors who are able and willing to apply that knowledge in making decisions or influencing others in organizations” (1996: 486). For Miller, if knowledge were unrelated to organizational action or decision making, it would be relevant only to individual learning, and not to organizational learning. However, it is important to recognize that there can be a time gap between the points in time when knowledge is created and used (Sitkin, Sutcliffe, & Weick, 1999).

In the model in Figure 3, we also argue that while learning creates new knowledge, knowledge affects future learning. Learning processes are ongoing and iterative and existing knowledge impacts learning, because it governs what gets noticed and flagged as a problem (Tiemessen, 1997). This tension between learning and knowledge is represented in

Crossan et al.'s (1999) feed-forward and feedback flows of knowledge. The firm innovates and renews itself through the feed-forward process and new knowledge is created and institutionalized. At the same time, organizational level systems, structures, strategies, and routines guide the future learning of individuals and groups through the feedback process, exploiting what the firm has already learned (Crossan et al., 1999). Kogut and Zander (1992), in their model of how knowledge grows, also argue that firms learn in areas closely related to their existing practice. Using a path dependency argument, they state that new learning does not occur in abstraction from current abilities and that it depends on the firm's combinative capabilities to generate new applications from existing knowledge. Finally, Nelson and Winter (1982) explain how previous choices made by individuals, which are embedded in organizational routines - organizational knowledge - shape and constrain further individual choices.

The previous discussion leads to the following proposition:

P1: Knowledge/IC and learning are linked in a circular relationship. Learning is the process through which knowledge/IC is created and developed. Current knowledge/IC impacts future learning.

2.2. The moderating role of a learning/knowledge strategy

Researchers have opposite views about the impact of learning and knowledge/IC on firm performance. On one side of this discussion are those scholars who establish a positive link between these constructs. In their pioneer work, Cangelosi and Dill (1965) propose that improved performance is learning. Later, Fiol and Lyles (1985) suggest that, irrespective of the underlying interpretations of organizational learning, "in all instances the assumption that learning will improve future performance exists" (1985: 803). The perspective of the knowledge-based view further stresses a positive link between knowledge and performance. It is expected that knowledge, which is valuable, rare, inimitable and non-substitutable (Barney, 1991), would lead to competitive advantage. In terms of IC research, it has been proposed that social and intellectual capital underpins organizational advantage and that some firms perform better than others, because they are better in creating and sharing social and intellectual capital (Nahapiet & Ghoshal, 1998).

On the other side of the discussion are authors (Argyris & Schoen, 1978; March & Olsen, 1975), who do not see a direct relationship between learning, knowledge, and performance. For example, Levitt and March (1988) state that "learning does not always lead to intelligent behavior" (1988: 335) and Huber (1991) adds that "learning does not always increase the learner's effectiveness, or even potential effectiveness... Entities can incorrectly learn, and they can correctly learn that which is incorrect" (1991: 89). Complementary to this view is Leonard's (1992) description of how core rigidities are deeply embedded knowledge sets that hinder innovation. Arthur's (1989) law of increasing returns also supports the equivocal link between knowledge and performance. While having a good base of knowledge means that a company can leverage it and increase its advantage over competitors, having a bad base of knowledge means that the company that is losing advantage can only lose further advantage. Finally, in their review of the OL literature, Crossan et al. (1995) conclude that good performance is not a sign of learning and that learning may negatively impact performance in the short term.

The IC field has also incorporated the performance construct to its discussion. Stewart (1994) argues that IC is the raw material from which financial results are made and that the objective of managing intangible assets is to lead to tangible results. Furthermore, IC performance has been described as the changes in the levels of the IC stocks (Bontis et al., 1999) and Ross and Ross (1997) mention that the growth/decline of the IC of a company is increasingly interpreted as an early warning signal of subsequent financial performance.

In conclusion, OL, KM, and IC views of the impact of learning, knowledge, and IC on performance are diverse. While the OL literature presents an equivocal link between the learning process and performance, the knowledge literature states that knowledge - if recognized as a source of competitive advantage - explains differences in performance. Finally, the IC literature is mainly focused on aligning IC indicators with organizational goals and measuring financial returns on IC.

While recent empirical efforts have found support for the direct impact of learning, knowledge, and human and social capital on performance (Appleyard, 1996; Bontis et al., 2001; Decarolis & Deeds, 1999; Hitt, Bierman, Shimizu, & Kochhar, 2001; Yeoh & Roth, 1999), we take these positive results with some caution. A simplistic analysis of the conclusions of these studies could mistakenly lead managers to think that “the more learning the better” and “the more knowledge the better”. To avoid this risk of misinterpretation, we argue in our model that when studying learning and knowledge as antecedents of organizational performance, it is critical that contextual variables, and in particular strategic variables, be included. The effectiveness of learning can only be assessed on the basis of its utility in guiding behavior relative to the organization’s relevant domain (Crossan, 1991). One example of efforts in the suggested direction is Crossan et al.’s (1999) work, where organizational level learning clearly captures the elements of strategic alignment between knowledge and the development of new products, systems, procedures, structures, and strategy. In their framework, it is not sufficient that organizations learn something new, but the new knowledge needs to be applied to a strategic context and needs to be relevant in that context (Bontis et al., 2001; Crossan et al., 1999).

Capturing this thinking, we include in our model a construct called “co-alignment”, which represents the mutual alignment between a firm’s business strategy and a firm’s learning/knowledge strategy. In the model in Figure 3, “co-alignment” is a moderator of the impact of learning and knowledge/IC on performance. Our model in Figure 3 shows that if learning and knowledge are not relevant to the firm’s purposes, they do not guarantee positive results. For knowledge to become a source of competitive advantage, firms need to match their learning/knowledge strategy with their business strategy. When a firm’s learning/knowledge strategy matches its business strategy, the impact of knowledge and learning is positive. If this match is not achieved, knowledge and learning may have no impact or even have a negative impact on performance.

In recent years, authors in the OL and KM field have started to develop the “learning strategy” and “knowledge strategy” constructs. Bierly and Chakrabarti (1996) define a knowledge strategy as the set of strategic choices that shape and direct the organization’s learning process and determine the firm’s knowledge base. In contrast to Bierly and Chakrabarti’s definition, Zack’s (1999) definition of knowledge strategy

explicitly includes the notion of fit to the firm's business strategy. He suggests that a knowledge strategy describes the overall approach an organization intends to take to align its knowledge resources and capabilities to the intellectual requirements of its business strategy. Through a knowledge strategy, organizations identify the knowledge required to execute the firm's strategic intent, compare that to its actual knowledge, and recognize its strategic knowledge gaps (Zack, 1999).

There are also initial efforts in the OL and KM fields towards understanding the dimensions of a learning/knowledge strategy. As part of their knowledge strategy taxonomy, Bierly and Chakrabarti (1996) describe four tensions in the learning process: the tension between external and internal learning, radical and incremental learning, fast and slow learning, and a narrow and wide knowledge base. Building on this work, Zack (1999) adds that a knowledge strategy includes decisions regarding the creation, development, and maintenance of a firm's knowledge resources and capabilities. These decisions are the choices between internal and external knowledge, and between exploration and exploitation. These two pieces of research cut across the KM and the strategy fields. In addition, Argote (1999) lists several tensions or tradeoffs in the learning process, which define a learning strategy. These are the tensions between group and organizational learning, heterogeneity and standardization, learning by planning and learning by doing, and the tension between fast and slow learning. Argote's (1999) work cuts across the OL and KM fields.

Given that these three lists of learning/knowledge choices barely overlap each other, it appears that neither list is comprehensive. However, for the purposes of this paper, we are not interested in providing a comprehensive list of the dimensions of a learning/knowledge strategy, but in emphasizing the importance of studying the impact of learning and knowledge on performance within the strategic context of the firm. In addition to Bierly and Chakrabarti's (1996), Argote's (1999), and Zack's (1999) work, other authors have introduced similar concepts such as "learning styles" (Ribbens, 1997), "learning modes" (Miller, 1996), "learning orientations" (Nevis, DiBella, & Gould, 1995), and "knowledge management styles" (Jordan & Jones, 1997). Table 1 summarizes the dimensions discussed in these conceptualizations. There is ample room for future research in the integration of these concepts.

The previous discussion leads to our second proposition:

P2: The co-alignment between a firm's learning/knowledge strategy and its business strategy positively moderates the relationship between learning/knowledge/IC and performance.

In the next section, we provide conclusions and directions for future research based on the proposed model.

CONCLUSIONS AND DIRECTIONS FOR FUTURE RESEARCH

The objective of this paper was to clear up the conceptual confusion in the learning field by providing synthesis and integrating three closely related constructs: organizational learning, knowledge management, and intellectual capital. To achieve this purpose, we

have critically reviewed previous research in an effort to understand how these three literatures fit together and how they can be aggregated into a more meaningful conceptual model for both academics and practitioners.

The first contribution of this paper has been to draw the boundaries of each of the field's domains. The conclusion from Figure 2 was that the fields greatly overlap. Although there are topics that are mainly being studied by one field (e.g. the knowledge-based view of the firm in KM) and topics, in which one community is the most advanced in its theoretical development (e.g. a multilevel theory of learning in OL), there are also multiple topics that are being studied by OL, KM, and IC researchers at the same time. We believe there are huge opportunities for each of the communities to learn from the experience and the developments of the others and to advance the field together.

One first and easy step towards more common work is for authors to simultaneously use the learning, knowledge, and intellectual capital constructs in their discussions. Nowadays, researchers in one field often fail to acknowledge the other. This is clearly recognized when researchers in organizational learning exclude the terms "knowledge" and "intellectual capital" from their studies and researchers in knowledge management and intellectual capital do the same with the term "learning". The current body of knowledge on learning and knowledge includes theories focused on understanding types of knowledge and knowledge conversion processes (e.g., Nonaka & Takeuchi, 1995; Spender, 1994, 1996) and theories focused on understanding learning processes (e.g., Argyris & Schoen, 1978; Crossan et al., 1999). The next step is to integrate the vocabulary and the findings to provide more comprehensive descriptions of the phenomenon. Efforts in this direction are the studies by Miller (1996), Argote (1999), and Bontis et al. (2001).

Another conclusion extracted from our analysis is that the knowledge and intellectual capital concepts can be integrated into one single construct. We have discussed arguments in the current literature that state that intellectual capital is more than knowledge. However, a close look at the proposed components of intellectual capital led us to conclude that all the elements of human capital, structural capital, and relationship capital are in fact grounded on different types of knowledge. Some of this knowledge is embrained or embodied in individuals (human capital) and some of it is embedded, encultured, or encoded in non-human storehouses of organizational knowledge (structural and relationship capital). Although the intellectual capital field has been driven by its distinctive goal to measure and leverage intangible resources, we think that these efforts can be pursued in a collective effort with organizational knowledge researchers. Important benefits can be obtained from the reconciliation of the knowledge and intellectual capital and the knowledge management and intellectual capital management concepts, where coincidences, more than differences, need to be highlighted.

We also emphasized in our discussion the strong link between the learning process and the knowledge management processes. Previous literature has tried to include the first in the second, or the second in the first. In our model we recognize that learning can be defined in terms of the processes of knowledge creation, retention, transfer, etc. That is, authors studying organizational learning and researchers studying knowledge acquisition, knowledge creation, and knowledge development are likely to be studying the same phenomenon from different perspectives and with the use of different terminology. In addition, as mentioned earlier, when knowledge-associated processes are studied at

different levels of analysis, learning is linked to processes such as knowledge share, transfer, access, etc.

A final conclusion from our model is that learning and the accumulation of knowledge and intellectual capital only leads to better performance, when they support and are aligned with the firm's strategy. We argue in this paper that researchers interested in studying the impact of OL, KM, and IC on performance need to be more specific about the characteristics of the knowledge that enhances performance and the conditions under which learning leads to competitive advantage. We have proposed the co-alignment between a firm's learning/knowledge strategy as a moderator of the impact of learning and knowledge/IC on performance. We see a lot of potential in the further theoretical development of the "learning/knowledge strategy" construct and invite researchers in the three fields to work together to define the critical decisions or tradeoffs that managers need to address regarding learning, knowledge, and intellectual capital resources in their firms.

A final direction of future empirical work is to operationalize the constructs included in our model and to test it. In testing the model, future research needs to address the choice of appropriate measures and methodology. Several instruments are available in the academic and managerial OL, KM, and IC literatures. It will be necessary to assess their fit to our integrative model. In particular, it will be important to find or to develop measures that capture the nature of learning as a process (flow) and knowledge/IC as the content of learning (stock). Furthermore, future research can build on Bierly and Chakrabarti's (1996) operationalization of a knowledge strategy in the pharmaceutical industry. To operationalize the co-alignment between a firm's business strategy and a firm's learning/knowledge strategy, researchers can build on empirical work in contingency and configurational theory (e.g., Thomas, Litschert, & Ramaswami, 1991; Venkatraman & Prescott, 1990).

To conclude, we propose the present framework as an instrument to facilitate communication between researchers working on various facets of the learning phenomenon. It is not our intent to force fit the model, but to build on previous research to open up the possibility for dialogue that will further develop this integrative model.

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TABLE 1
Summary of dimensions incorporated in Learning/Knowledge strategies

Author	Typology/Taxonomy	Dimensions
Bierly & Chakrabarti (1996)	Four knowledge strategies	<ul style="list-style-type: none"> • External-Internal learning • Incremental-Radical learning • Fast-Slow learning • Breath of knowledge base
Argote (1999)	Four tensions in the learning process	<ul style="list-style-type: none"> • Group-Organizational learning • Heterogeneity-Standardization • Learning by planning-Learning by doing • Fast-Slow learning
Zack (1999)	Six knowledge strategies	<ul style="list-style-type: none"> • External-Internal knowledge • Exploration-Exploitation
Miller (1996)	Six modes of learning	<ul style="list-style-type: none"> • Degree of strategic choice (voluntarism-determinism) • Mode of thought and action (methodological-emergent).
Nevis, DiBella & Gould (1995)	Seven learning orientations	<ul style="list-style-type: none"> • Knowledge source (internal-external) • Product-process focus • Documentation mode (personal-public) • Dissemination mode (formal-informal) • Incremental-radical learning • Value-chain focus (design-deliver) • Skill development focus (individual-group)
Ribbens (1997)	Four organizational learning styles	<ul style="list-style-type: none"> • Random-Sequential knowledge • Abstract-Concrete knowledge
Jordan & Jones (1997)	Knowledge management styles	<ul style="list-style-type: none"> • Knowledge acquisition <ul style="list-style-type: none"> • Focus: internal-external • Search: opportunistic-focused • Problem-solving <ul style="list-style-type: none"> • Location: individual-team • Procedures: trial and error-heuristics • Activity: experimental-abstract • Scope: incremental-radical • Dissemination <ul style="list-style-type: none"> • Processes: informal-formal • Breath: narrow-wide • Ownership <ul style="list-style-type: none"> • Identity: personal-collective • Resource: specialist-generalist • Storage/memory <ul style="list-style-type: none"> • Representation: tacit-explicit

FIGURE 1
Knowledge-Knowing-Learning Matrix

		KNOWLEDGE	
		Stable	Change
KNOWING	Stable	<ul style="list-style-type: none"> •NO LEARNING •EXECUTION 	<ul style="list-style-type: none"> •LEARNING OF NEW FACTS (learning by reflection) (knowing-what/theoretical knowledge)
	Change	<ul style="list-style-type: none"> •APPLICATION OF KNOWLEDGE (learning by doing) (knowing-how/practical knowledge) (knowledge in action) (e.g. consulting frameworks; new piano song) 	<ul style="list-style-type: none"> •LEARNING OF SKILLS •LEARNING OF NEW FACTS AND ITS APPLICATION (e.g. arts, sports, leadership)

FIGURE 2
Boundaries of the Organizational Learning, Knowledge Management,
and Intellectual Capital fields

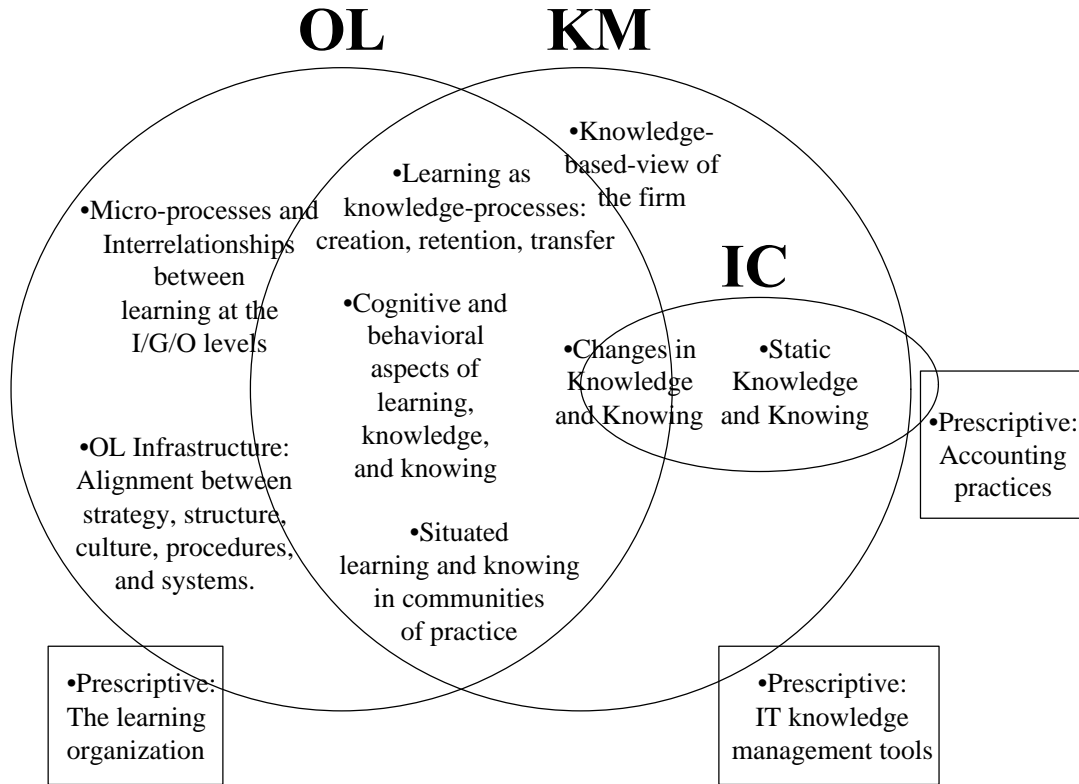


FIGURE 3
Integrative Conceptual Model of
Learning, Knowledge, Intellectual Capital, and Performance

