HOW LEARNING CAPACITY INFLUENCES ON PERFORMANCE: AN EMPIRICAL EVIDENCE

IE Working Paper DO8-153-I 11 / 04 / 2003

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Abstract

It is widely recognized that the development of a learning capacity is a fundamental factor for the achievement of a durable competitive advantage. But the relevance of the learning capacity for the improvement of the organizational performance, and thus competence, has been insufficiently developed. Based on data from 111 Spanish Companies, this paper explores the relation between the learning capacity and the improvement of business performance by comparing how the main dimensions of the learning capacity –the stocks and flows of knowledge- impact on performance, in economic and non-economic terms. Results indicate that those organizations with the highest levels in their stocks and flows of knowledge obtain a superior performance.

Keywords

Learning capacity, knowledge management and performance

Depósito Legal: M-20073 I.S.S.N.: 1579-4873

Introduction

Today's competitive environment and the explosion of information society have made knowledge a true value to harmonize flexibility and stability in organizations. Those organizations that want to satisfy market requirements must be able to reach a learning capacity for the development of knowledge. In order to accomplish this aim, organizations must develop the ability to perceive and understand the environmental conditions. This entails the building, sharing, and integration of a knowledge structure representative of reality. When the environment conditions change, the knowledge structures must be transformed and refined through learning in accordance with the new conditions. Therefore, organizations must continuously adapt to the environment through knowledge storage and learning processes to enhance organizational competitiveness.

At present, learning capacity development is one of the most focal areas of research, becoming an interdisciplinary topic. Its advance is influenced by a variety of fields such as organizational theory, production management, strategy, psychology or management science (Easterby-Smith, 1997). But even when specific literature has often recognized the value of learning and knowledge in organizations, there is not enough research about learning capacity's influence on organizational performance and on their competitive position. There is no other empirical work than a few in-depth case studies, and related conclusions are frequently unsatisfactory and even contradictory (Castaneda, 2000; Goh and Ryan, 2002). It is also difficult to find reliable measures or metrics for this topic. For this reason, the analysis of the learning capacity's related effects on organizational performance is one of the most attractive analysis to carry out positive contributions to this field.

The main objective of this study is to explore the relationship between learning capacity in organizations and business performance and, ultimately, to determine how learning capacity is associated to a better performance. Hence, our paper, first, discusses the relationship between learning capacity and organizational performance. Then, we give entrance to a construct of the learning capacity, identifying the essential dimensions that determine its founding and, hence, its consequences. On the base of these essential dimensions, we categorize organizations into various extreme situations, identifying differences in their learning capacity and its implications. Analysis methodology is then introduced, which include information about the sample, study measures, data analysis and empirical results. Specifically, we use data to empirically analyze organizational differences in learning capacity and their linkage to performance. Finally, a discussion of the implications, limitations and future research directions are offered.

Learning, knowledge and organizational performance

In the last few years, the literature has shown a great production of research contributions concerning learning in organizations as a sure condition for knowledge development (Argyris and Schön, 1978; Duncan y Weiss, 1979; Fiol and Lyles, 1985; Huber, 1991; Dogson, 1993), but little convergence or consensus on what is meant by the term, on its basic nature and its consequences has emerged (Huber, 1991; Crossan et al., 1999). As a result, researchers sustain different views about the link between knowledge, learning and organizational performance. However, it is possible to find

arguments to defend that learning processes and knowledge accumulation are sure precedents for better performance. Fiol and Lyles (1985) suggest that it is possible to presume that learning will improve future performance. Senge (1990) indicates that over the long term, superior performance depends on superior learning. And various authors have also recognized the importance of learning capacity to overall business performance (Stata, 1989; Cohen y Levinthal, 1990; Stewart, 1997; Nahapiet y Ghoshal, 1998; Bontis, 1999). Based on these initial observations, we consider that the development of a learning capacity induces a positive impact on organizational performance and, hence, on value creation.

The idea of the existence of a positive connection between knowledge, learning processes and organizational performance often links the potential effects to the economic success. But those effects cannot be determined exclusively by an economic assessment. Effects also deal with the reaction of others (e.g. customers or employees) to the actions of the organization. This reaction will be better when the capacity to learn will guide the identification and attainment of others expectations along with the organization's purposes. So, we suggest that the influence of the learning capacity on organizational performance has a dual nature: economic and non- economic (Zahra et al., 1999; Goh and Ryan, 2002).

There is only a way to enlarge an organization's economic performance: the satisfaction of market demands on the basis of the improvement of customer relations. Improvement of current or potential customer relations relies on the organizational learning capacity, which determines customers' perception about the organization's products or the value of service. Those customers' perceptions will be improved to the extend in which the organization will develop its potential to put internal knowledge at the disposal of customers, satisfying their needs, strengthening the established relations and improving the economic value that it all produces for the organization (Figure 1). Indeed, companies having superior knowledge and learning processes are able to coordinate and combine their traditional resources and capabilities in new and distinctive ways, providing more values for their customers than their competitors can (Teece et al., 1997). And if customer relations prosper, it is only a question of time to gain a positive result on economic performance. So, the organizational potential for customers to extend its active knowledge, in such a way that it triggers the satisfaction of those customer's needs, is a critical precedent of economic performance. According to previous arguments, it is necessary to valuate the impact of knowledge and learning processes by including the traditional measures of economic performance as well as those other performance conductors not strictly economic. This perspective is consistent with the numerous efforts to measure intellectual capital in organizations (Kaplan and Norton, 1992, 1993, 1996; Stewart, 1997; Martin, 2000; Carlucci et al., 2002). Intellectual capital models are related to the valuation of intangible resources in organizations. And even when it is still a non perfect field of analysis, it has included several discussions about performance measurement arguing that it is necessary to balance the traditional economic valuation with the non-economic valuation of organizational performance. Another recent performance evaluation model, the Performance Prims (Neely and Adams, 2001), also takes in consideration stakeholders' satisfaction as a fundamental performance aspect that determines the organization's success.

The double effect –economic and not economic- on competitiveness is not the only consequence of the learning capacity. It can also be considered as a stimuli for the future learning potential in the organization (Dragonetti and Roos, 1998). In this sense, Mintzberg et al. (1995) and Bontis et al. (2000) argue that performance provides important feedback about the efficiency of a learning process and ultimately affects how an organization continues to learn. It means that learning effects constitute a support to preserve learning capacity as well as for their enlargement. This feedback effect is known as "learning to manage knowledge" (Revilla, 1998), whose purpose is the reflection about past experiences, successful or not, to assimilate these reflections and go through the desire of improving knowledge management. Nevertheless, in the present study we do not undertake the empirical analysis of this retroactive result.

In summary, we can point out that the capacity to learn in organizations is not simply a collector or storehouse of knowledge but a processor of knowledge, which influences the degree to which organizations are likely to promote continuous learning as a long-lasting core competency (Calantone et al., 2002) and as a source of better performance. In other words, the development of a learning capacity is not an end itself, but an intermediate phase to obtain some effects on organizational performance. Keeping all these ideas in mind, our next step is to explain how organizations learn in order to understand the competitive value of knowledge and learning processes in organizations.

The learning capacity

Published research has largely suggested that environmental perceptions are the main driver of learning in organizations (Levitt and March, 1988; Leonard Barton, 1995; Nevis et al., 1995) and that learning, as an integral part of working, occurs naturally in the vast majority of organizations driving the alignment between organization and environment. The capacity to learn depends on the ability to fill the gap between the knowledge stored from the past and the knowledge required fitting changing environmental conditions (Zack, 1999). It implies a change in the organizational expectations, which leads to modifications in behaviors, actions or both. As a result, learning supports the evolution of knowledge within the organization. From this point of view, we understand the learning capacity as the organizational potential to use available knowledge within the organization and to continually renew that knowledge. This capacity determines the organizational improvement and, hence, its competitiveness.

Learning capacity in organizations is often characterized by two essential dimensions (Dierickx and Cool, 1989; Stewart, 1997; Bontis, 1999; Decarolis and Deeds, 1999; Vera and Crossan, 2000): 1) a static dimension, based on the structures that hold the stocks of knowledge –tacit or explicit- which are internal to the organization; 2) a dynamic dimension, based on the knowledge flows –representative of learning processes- that embody the knowledge streams into the organization which make knowledge stocks evolution possible. Knowledge stocks are the input of numerous knowledge flows as knowledge generation, accumulation, distribution and utilization, which may be assimilated and developed into stocks of knowledge. Therefore, flows of knowledge are a continuous and dynamic interaction, which shapes different stocks of knowledge and qualifies organizations to create, sustain and generalize effective knowledge. Accordingly, this research broadens both stocks and flows of knowledge

and recognizes how both dimensions interrelate and reinforce each other as a central condition for learning capacity in organizations.

Knowledge stocks and flows interrelation occurs at several levels in the organization (Levitt and March, 1988; Nonaka and Takeuchi, 1995; Crossan et al., 1999): individual, group and organizational level. Obviously, organizations learn through their individual members –individual learning- (Kim, 1993; Hedlund, 1994). But each one of these members needs to share their knowledge with other organizational members and integrate it to provide a company with non-human knowledge. As a result, a collective learning at the group level –group learning- as well as at the organizational level –organizational learning- is then developed (Nonaka and Takeuchi, 1995). Thus, learning in organizations takes place at the individual level and also at the group and organizational levels. Hence, individuals, groups and organizations develop a knowledge stock, which is moved between these different levels through dynamic knowledge flows.

Additionally, learning in organizations can be aimed to 1) generate knowledge variation within organizations and 2) acquire knowledge of the knowledge already available within organizations. Therefore, learning processes in organizations involve a tension between creating and assimilating new knowledge –knowledge exploration- and diffusing and using what has been learnt from the past –knowledge exploitation- (March, 1991). Knowledge exploration and knowledge exploitation are complements rather than substitutes. As a result, knowledge flows within organizations should maintain an appropriate balance between both knowledge exploration and exploitation in order to enhance learning capacity in organizations.

Based on Bontis (1999) and Bontis et al. (1999) contributions, Figure 2 integrates previous ideas in a learning framework that combines the different levels of learning and the balance between knowledge exploration and exploitation. This framework shows how knowledge stocks reside in individuals, groups and the organization, and how they all are related by means of knowledge flows for exploration and exploitation. These flows drive knowledge dynamic evolution. Exploration flows generate knowledge and transfer new knowledge from individuals to groups and from these levels to the organization. Exploitation flows utilize knowledge and transfer the available knowledge from the organization to groups, and from these levels to individuals, affecting how people act and think.

The interaction between the different elements that make up the learning capacity is expected to create value for organizations. So, organizations must encourage stocks and flows of knowledge in such a way that continuous learning at the individual, group and organizational level will determine the impact on customer relations as the basis for better economic performance (Saint-Onge, 2002). Figure 3 displays the interrelation between learning capacity, customer relations, and economic results. Hence, the way in which organizations conform their learning capacity is critical to superiorly define those external (or internal) links that bring value to the organization.

Organizations and learning capacity: a two-dimensional categorization

Learning capacity has often been classified within different modes or categories (Shrivastava, 1983; Blacker, 1995; Miller, 1996). We suggest that it is better to talk about different categories of organizations on the base of its learning capacity than talking about different categories of the learning capacity.

Nevertheless, it is true that learning capacity varies between organizations as a result of a large number of factors. We have argued that the upholding of a learning capacity demands both knowledge and learning processes and both of them work together. According to this, the learning capacity involves the combination of stocks and flows of knowledge in tandem for learning capacity to occur. However, it is feasible to presume that differences on the attributes of the stocks and flows of knowledge between organizations will produce differences in their capacity to learn. Thus, and on the base of these essential dimensions, we categorize the organizations by creating a matrix of four extreme situations that we have labelled: minimized learning capacity, static learning capacity, dynamic learning capacity and inclusive learning capacity. Figure 4 shows the four stated situations. The knowledge stocks level considers the degree of gathering and storage of the knowledge structures (portfolio) located in individuals, groups or the organization. The second dimension, the knowledge flows level, corresponds to the degree of generation, assimilation, diffusion and utilization (exploration and exploitation) of knowledge within the organization. Thus, this matrix represents a framework for the various combinations of the stocks and flows of knowledge which result into differences in the learning capacity in organizations. These combinations act as a previous condition to produce some effects on organizational performance.

Cell 1 shows organizations that uphold a very narrow learning capacity, based on low levels of the stocks and flows of knowledge. Learning capacity is *minimized* or is just in early development. This context is typical of those organizations that barely let in transformations, which are probably mature or simply stagnated. So, in the current turbulent business environment, this situation is critical or recessive, and reduces the effectiveness of companies quickly.

Cell 2 represents to those organizations in which the learning capacity is founded on the storage of an important stock of knowledge, while knowledge flows are barely developed –probably no more than what it is just required-. This context is typical of those organizations which uphold a *static* learning capacity based on the encouraging of a worthy knowledge structure to fulfil customer requirements. Big and experienced organizations, with a strong tradition or some kind of well-established competitive advantage, exemplify quite well this category. Anyway, organizations like these must realize that as important as the storage of an appropriate stock of knowledge and the institutionalisation of interdependence relationships is to foster the right streams of flows. On the contrary, knowledge stocks are hardly mobilized to be expanded between organizational levels.

In Cell 3, organizations engage in deep knowledge flows development. These organizations do not have the capacity to absorb and accumulate permanent knowledge

stocks, so we could say that they support a *dynamic* learning capacity prompted by the necessity to continuously adapt organizational activities for value generation. All their efforts are focused on the exploitation on temporary competences and on their fast substitution through knowledge exploration.Thist is a risky situation since although the flows of knowledge can be promptly adapted, the storage of an appropriate stock of knowledge cannot (and this could prevent its later utilization).

Finally, Cell 4 groups organizations that develop an important learning capacity on the base of a great level of stocks of knowledge as well as on a great level of flows of knowledge. Knowledge stocks are accumulated by choosing appropriate paths of flows of knowledge over a period of time. This means that organizations uphold an inclusive learning capacity which characterizes a situation where the interrelation between knowledge stocks and flows balances the potential to develop, maintain, apply and improve abilities, qualities and activities in such a way that they become a source of sustainable competitive advantages.

Understanding learning capacity differences between categories of organizations can help us to discern the effects that learning capacity produces on organizational performance. In this sense, we can presume that the category in which an organization is found will have implications on what can be expected in terms of performance outcomes.

Empirical research

Data collection

The data has been collected through written questionnaires from a total of 111 Spanish companies, which are the point of departure of our empirical analysis about the influence of learning capacity. Previously, we have validated the written questionnaire through a pretest and, subsequently, administered it to a random sample of 1064 Spanish companies of small and medium size –no more than 2500 employees- belonging to industrial and service sectors. Accordingly, 10,52% of the companies contacted have finally participated in the study. Top managers and human resources managers were selected to respond the questionnaire because they are found to play key roles in the development of a learning capacity in organizations. They are also generally able to understand the characteristics of overall organization. In this, research variables were operationalized based on pretest and related studies.

Measures description

Variables have been built on a multiple-items method, which enhances confidence about the accuracy and consistency of the assessment. Each item was based on a five point Likert scale. Because multiple-item construct measures each variable, and in order to verify that the items tapped into their stipulated construct, a factor analysis by principal components with a varimax rotation has been executed. Factor analysis by principal components has permitted us to resume data and structure the different factors that we need for analysis. So, we extracted an only factor for each one of our variables, determining factor loadings for its corresponding items. Analysis was made individually for each factor and results are resumed in Tables 1, 2 and 3, which also include the

reliability test for all the variables (assessed by Cronbach's alpha). The data was analysed using SPSS for Windows, Version 10.0.

Performance indicators

There is not an only or upper measure to assess the global impact of the learning capacity on organizational performance. According to our theoretical development, we measured organizational performance from an economic and non-economic perspective. So, we adopt two variables modeled as one-dimensional constructs with multiple-indicator measures. Non-economic performance was measured addressing issues such as customer's satisfaction, employee's described through overall profitability satisfaction and the organizational reputation. Economic performance was, sales growth and profit growth (see appendix for details). Principal componets results are outlined in Table 1. Internal scale reliabilities (Cronbach's alpha) exceed the suggested minimum reliability for both variables. Performance variables were encoded to a scale from 0 to 10 facing subsequent research analysis.

Learning capacity

We have modelled learning capacity in organizations as a multidimensional construct in which knowledge stocks and flows are considered as representative dimensions. Knowledge stocks have been measured on the base of individual stocks, group stocks and organizational stocks of knowledge. Knowledge flows have been measured attending to exploration flows as well as to exploitation flows. Appendix displays the items used to measure each variety of stocks and flows in the questionnaire. Most of the measures were adopted from relevant literature, especially Bontis (1999). Principal components results are showed in Table 2 (all the variables were later encoded to a same scale) including internal scale reliabilities (Cronbach's alpha). Reliability values vary from 0.652 to 0.782, which generally exceeds the suggested minimum reliability. After extracting the factors that correspond to individual stocks, group stocks and organizational stocks and to exploration and exploitation flows, a second principal component analysis on knowledge stocks variables and knowledge flows variables has benn applied. The aim of this second analysis is to reduce them to two new variables which, respectively, represent knowledge stocks and flows of knowledge (as sub-dimensions of learning capacity). Both dimensions are useful to represent the framework of the organization on the base of their learning capacity (Figure 4). Table 3 outlines the analysis results. Once again, both variables were later encoded to a same scale. Internal scale reliabilities (Cronbach's alpha) are within the acceptable limits as well.

Research methodology

In order to explore the impact of the learning capacity on the organizational performance we need to create an appropriate framework for learning capacity to derive the high or low impact on performance. To do this, our empirical research was driven as follows:

First, we segment our sample into four categories in agreement with their levels in their stocks and flows of knowledge. Specifically, we choose the medium value as the cross section between dimensions to segment the sample within categories. So, the

combination of the two dimensions provides four extreme situations just as it has been theoretically explained and showed in Figure 4.

Next, we perform an univariate analysis (mean, deviation, minimum and maximum value) to compute the performance value (NOECPER and ECPER) within each context. We also perform a one-way ANOVA test between learning capacity and organizational performance in order to prove the statistic signification ($p< 0.05$) of the mean differences for both variables of performance –non-economic and economic- among the different categories. It includes the results of a post hoc Tukey's test to provide a more detailed depiction of the mean differences between cells. It all will allow us to recognize the relation between the stocks and flows of knowledge and organizational performance in its dual nature.

Again, SPSS for Windows, Version 10.0 was chosen for data analysis.

Empirical results

The evaluation of the results will be completed using Table 4. Overall it shows a positive result between performance and learning capacity. So, it is observed that those organizations that present the major levels in their stocks and flows of knowledge (inclusive learning capacity) obtain a better performance in economic as well as in non-economic terms. On the contrary, those organizations that maintain low levels in their stocks of knowledge as well as in their flows of knowledge (minimized learning capacity) reach a considerable and significant minor performance, especially in non-economic terms.

The minimum and maximum values obtained for the inclusive learning capacity (cell 4) are significant better than values obtained for the minimized learning capacity (cell 1). These results are also displayed in Figure 5. They confirm the existence of significant differences on organizational performance as a result of the differences in learning capacity. In other words, these results confirm the premise that there is a positive relationship between learning capacity, assessed through stocks and flows of knowledge, and organizational performance.

The static learning capacity (cell 2) and the dynamic learning capacity (cell 3) are more difficult to describe. Comparing the results of both situations, we observe that performance are better for cell 2 than for cell 3, even when it does not exist relevant differences for minimum and maximum values. Indeed, those organizations that focus their learning capacity on the generation of knowledge flows (dynamic learning capacity) usually reach a moderate performance. On the contrary, those organizations that focus their learning capacity on the accumulation of knowledge stocks over time (static learning capacity) obtain a good impact on their non-economic performance and, specially, on the economic one. Likewise, it makes sense to observe that values in economic and non-economic performance in the static and dynamic learning capacity (cells 2 and 3, respectively) are better than values in the minimized learning capacity (cell 1), but worse than the values in the inclusive learning capacity (cell 4). The exception is the economic performance for cell 3 (even smaller than for cell 1). This is not surprising if we keep in mind that lack of alignment between knowledge stocks and flows affects learning capacity and, hence, affects the consequences on organizational

performance. This evidence points up the significance of the alignment and mutual reinforcement between the knowledge stocks and flows within organizations.

Nevertheless, it is also interesting to observe that the second best values (following those organizations with an inclusive learning capacity, cell 4) in economic and non-economic performance takes place for organizations with a static learning capacity (cell 2), which reflects the situation of those organizations with high levels of knowledge stocks. Concretely, we emphasize the significant increases of performance –especially economic performance- from cell 1 to cell 2 and from cell 3 to cell 4, in which organizations evolve from a situation of low levels in their knowledge stocks to situation of high levels in their knowledge stocks. This does not take place when organizations evolve from a low development in their knowledge flows to a high development. So, we can assume that the effect of learning capacity on organizational performance is not instantaneous, but a result derived from the accumulation and adaptation of a notable portfolio of knowledge stocks over time.

It is also worthy to mention that the increase on performance produced from cell 1 to cell 4 (minimized to inclusive learning capacity) is specially significant in the case of non-economic performance, which confirms that learning capacity in organizations generates a "customers learning". In addition to this, those organizations with the best non-financial performance (cell 4 and cell 2) also reach the best financial performance. Then, it is not wrong to presume that non-economic performance can be used as leading indicators of economic performance.

Discussion

There are three aspects of this research that merit further discussion. The first deals with the discussion of the implications of the findings for future academic research and management practice given the underlying theory and methodology applied. This leads into a second discussion about the potential limitations of the study. Finally, we discuss and suggest the possibilities for future research.

Implications for research and management

The contributions of this study are important for both academic researchers and managerial practitioners.

This study contributes to the literature of learning in organizations by covering the relationship that exists between learning capacity in organizations and business performance. It also advances the empirical research in the field of organizational learning. By arguing that learning capacity in organizations is based on knowledge stocks and flows connections, this research underscores the importance of knowledge and learning processes as preconditions for improved organizational performance. Specially, we suggest business performance can be valuated in economic terms as well as non-economic. Specifically, the improvement of economic and financial performance is preceded by the improvement on non-economic or non-financial conditions related to customers' satisfaction, organizational reputation or even employees' satisfaction.

Our results also suggest that the relationship between stocks and flows of knowledge is quite critical for an organization's competence. A firm's ability to support superior

knowledge stocks can generate a high level of competitive advantage, but it will be difficult to maintain that level of competence over time. A firm that is good at knowledge flows development but does not have superior knowledge stocks eventually should attain knowledge superiorities but is not always the most profitable. But a company that has superior knowledge stocks and is good at knowledge flows development should be able to generate and preserve over time its dominant competitive advantage. Hence, we confirm that organizational performance is in large part derived from knowledge stocks, but as important as possessing superior levels of knowledge stocks is to foster them by means of the appropriate paths of flows of knowledge that sustain, expand and make use of those knowledge stocks over time. It means that knowledge flows enhance the positive relationship between knowledge stocks and organizational performance acting as a reinforcing mechanism to the original stocks (Bontis, 1999).

The results of this study also makes a contribution to managerial practice by helping to clarify that it is important that practitioners focus their efforts when managing knowledge by considering both stocks and flows of knowledge. Knowledge stocks at all levels are positively linked to organizational performance and this link is enhanced by flows of knowledge. But they must not forget that while knowledge flows can be adjusted nearly instantaneously, knowledge stocks cannot. So, it is imperative for managers to foster exploration flows as well as exploitation flows in order to continuously accumulate and renew an appropriate stock of knowledge, in quality as well as in quantity. Flows need to be constantly managed in order to keep the alignment relative to the desired knowledge stock (Bontis, 1999).

Managers must also realize that as important as the realization of superior economic performance is the reaction of others (customer, employees, etc.) to the organizational activity. Indeed, the way how market and people perceive the value of products, services and processes is important to strength the relationships established and to enhance the economic value produced by the organization.

Limitations and future research directions

As with any exploratory research, this study is subject to a number of limitations that need to be addressed.

Indeed, our study contributes to learning capacity assessment by demonstrating that it is possible to measure theoretical relevant constructs that are unobservable. But even when we have tried to define our constructs as precisely as possible by drawing on relevant literature and to closely link our measures to their theoretical underpinnings, the measurement items used here can realistically be thought of as only proxies for an underlying and latent phenomenon that is neither fully nor easily measurable.

A second limitation is the fraction of the large sample for the individualized analysis of the four situations created in the framework for learning capacity. It all implies an important reduction of the sample size within each situation, which also reduces the statistical accurateness of the study and its findings.

We could also mention as a limitation that we have not included in this analysis the learning that takes place at the interorganizational level. Several authors (Kogut and Zander, 1992; Nonaka and Takeuchi, 1995; Miner and Mezias, 1996) identify learning

that takes place between organizations as an essential constituent of the capacity to learn in organizations, but we have not considered it in order to make the single organization our central unit of analysis.

To counterbalance limitations, there are several directions for extension of this research. In this paper, business performance has been the organizational outcome and, hence, a dependent variable. But future research should attempt to assess the degree in which business performance provides important feedback about the efficiency of learning capacity and ultimately enables future learning capacity. The purpose should be to test the existence of a retroactive effect that ties learning capacity and performance in a continuous loop. Research on this issue may require a longitudinal approach, by noticing the evolution of learning capacity and organizational performance over time. Longitudinal data should also instigate a more exhaustive study of the relationship between learning capacity and superior performance over time as well as the relationship between economic performance and non-economic performance**.**

Future research should also identify the antecedents or enablers of the organizational learning capacity and construct a comprehensive framework of both enablers and consequences. Thus, this future subject of research could estimate the moderating effect of knowledge management on the relationship between learning capacity and organizational performance.

In summary, this research has tried to present a broad perspective of learning capacity as a cycle of stocks and flows of knowledge across three levels –individual, group and organization- driven by knowledge exploration and exploitation. Our findings suggest that both stocks and flows are critical to overall firm performance. However, since knowledge stocks cannot be instantly attained, its influence on business performance will not have a rapid and positive influence on busines. Our results also suggest that it is necessary to consider the relationship between economic performance and non-economic performance.

Figure 1: Knowledge, learning processes and value creation

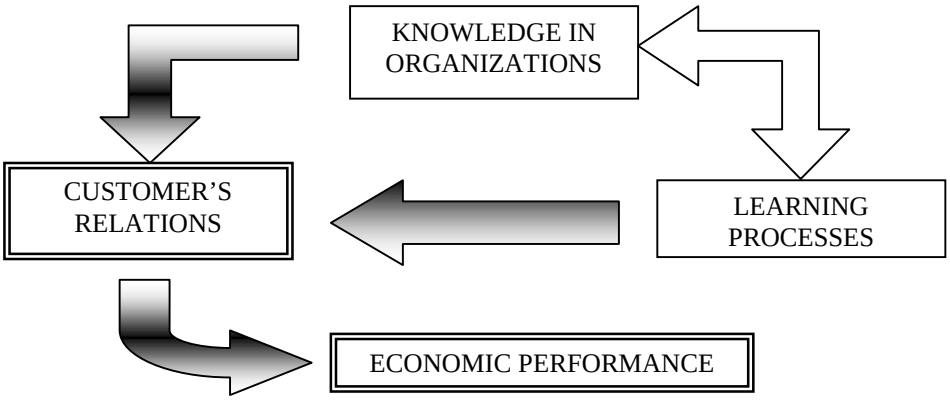


Figure 2: Learning capacity in organizations

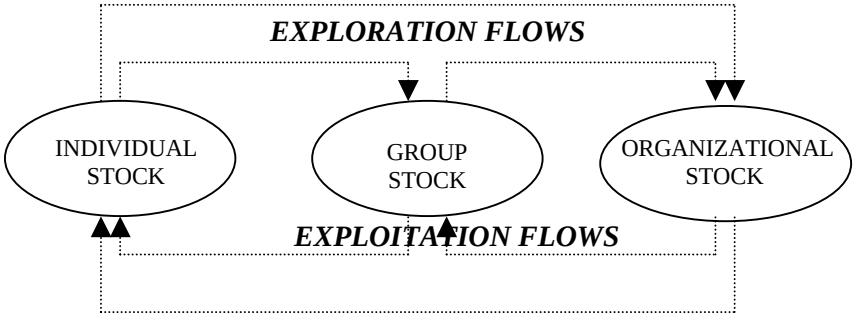
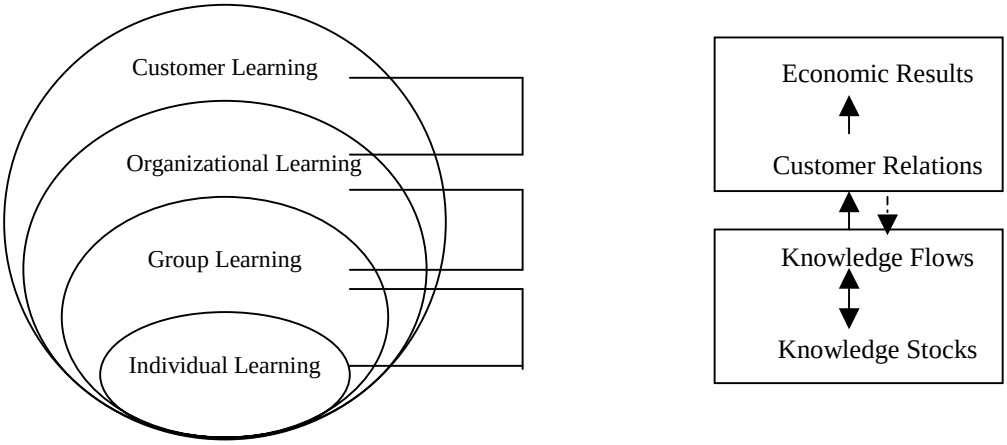


Figure 3: Value chain between learning and knowledge



Adapted from Saint-Onge (2002)

Figure 4: A framework for organizations on the base of their learning capacity

		Knowledge stocks level	
		LOW	**HIGH**
Knowledge flows level	**LOW**	*Cell 1* **Minimized learning capacity**	***Cell 2*** **Static learning capacity**
	HIGH	*Cell 3* **Dynamic learning capacity**	*Cell 4* **Inclusive learning capacity**

Figure 5
Impact of the learning capacity on organizational performance

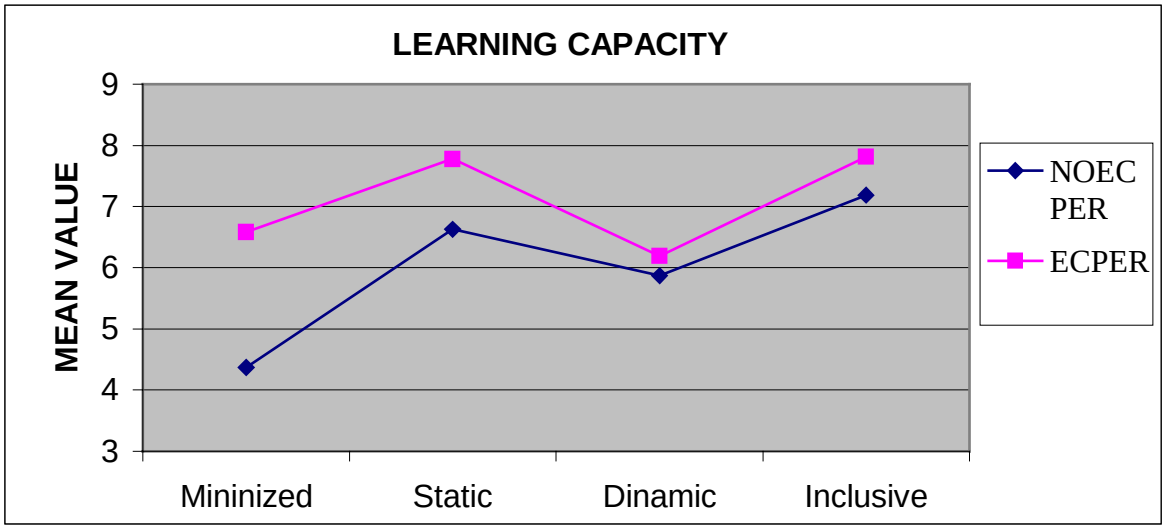


Table 1: Factor analysis for the extraction of organizational performance variables

PERFORMANCE				
Factors	**Items**	**Loadings**	**Explained variance %**	**Cronbach α**
No economic performance NOECPER	V19 V20 V21	0.770 0.801 0.840	64.703	0.7222
Economic performance ECPER	V22 V23 V24	0.910 0.888 0.931	82.772	0.8958

Table 2: Factor analysis for the extraction of the stocks and flows of knowledge variables

KNOWLEDGE STOCKS					KNOWLEDGE FLOWS				
Factors	**Items**	**Loadings**	**Explained variance %**	**Cronbach α**	**Variables**	**Items**	**Loadings**	**Explained variance %**	**Cronbach α**
Individual stock INDST	V1 V2 V3	0.880 0.805 0.797	68.602	0.757	**Exploration flows EXPLR**	V11 V12 V13	0.856 0.848 0.796	69.501	0.775
Group stock GROST	V4 V5 V6 V7	0.843 0.801 0.755 0.718	60.932	0.782	**Exploitation flows EXPLT**	V14 V15 V16 V17 V18	0.760 0.703 0.697 0.656 0.607	47.132	0.714
Organization stock ORGST	V8 V9 V10	0.804 0.751 0.750	59.114	0.652					

Table 3: Factor analysis for the extraction of the learning capacity variables

LEARNING CAPACITY				
Factors	**Items**	**Loadings**	**Explained variance %**	**Cronbach α**
Knowledge Stocks	INDST GROST ORGST	0.746 0.877 0.821	66.666	0.7476
Knowledge Flows	EXPLR EXPLT	0.912 0.912	83.183	0.7978

Table 4. Organizational performance in the different context of learning capacity

Variable		**Minimized Cell 1 (N= 39)**	**Static Cell 2 (N = 15)**	**Dynamic Cell 3 (N = 14)**	**Inclusive Cell 4 (N = 40)**	**ANOVA**		**TEST TUKEY**
						F	**Signif**	**Group differences***
NOECPER	Mean Deviation Minimum Maximum	4.3718 1.7032 0 7.86	6.6322 1.0646 5.49 8.98	5.8680 2.3980 0 8.98	7.1890 1.5199 3.24 9.98	20.227	.000	1-2 1-3 1-4
ECPER	Mean Deviation Minimum Maximum	6.5847 2.0829 0 10	7.7777 1.5003 5 10	6.1947 1.8739 2.5 10	7.8097 1.6924 3.36 10	4.827	.003	1-4 3-4

(*) Significant differences at the 0.05 confidence level

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