

The influence of CEO perceptions of personal mastery, shared vision, environment and strategic proactivity on the level of learning: Level I learning and Level II learning

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Abstract

This paper takes an in-depth look into the differences in learning based on the nature of the process, analyzing the influence of CEO perceptions of personal mastery, shared vision, environment and strategic proactivity on the level of learning. The hypotheses are tested using data from 239 Spanish firms. The results show that: (1) personal mastery and a well-understood environment have a positive and significant impact on the generation of Level I learning; (2) personal mastery, shared vision, ambiguous environment and strategic proactivity have a positive and significant influence on the generation of Level II learning; (3) both learning levels affect the generation of greater organizational performance and innovation.

Keywords: Learning level; Personal mastery; Shared vision; Environment; Strategic proactivity; Organizational innovation.

Suggested track: Practice-based perspectives on knowledge and learning.

1 Introduction

Learning is the process that covers the discovery, retaining and exploitation of the knowledge stored (Levitt & March, 1988), it being, therefore, an action that takes knowledge as an input and generates new knowledge as an output. Thus, learning is analyzed as the process by which knowledge, abilities and attitudes are brought together to achieve permanent changes in conduct, as the product of a certain practice or significant experience.

Based on the ontological dimension of knowledge, learning can be applied to the individual, to the team, to the organization or to the population as a whole, giving rise to different learning processes such as individual learning, team learning, organizational learning or inter-organizational learning. In this study we aim to concentrate on organizational learning.

Organizational learning is the capability (process) “within an organization to maintain or improve performance based on experience. This activity involves knowledge acquisition (the development or creation of skills, insights, relationships), knowledge sharing (the dissemination to others of what has been acquired by some), and knowledge utilization (integration of the learning so that it is assimilated, broadly available, and can also be generalized to new situations)” (DiBella et al., 1996, p. 363). In this way, an organization that learns must help towards the transformation and constant learning of all the members and of the organization itself. This is an organization that “learns to learn”.

This learning has become, more than ever, a need rather than a choice. Inability to learn is the cause of the disappearance of most firms before forty years have passed. Furthermore, organizational learning is an essential source of sustainable competitive advantage (Chonko et al., 2003; Johnson & Sohi, 2003) and is the responsibility of all the organization members (Senge, 1990).

There are diverse criteria for classifying types of organizational learning and the typology is not clear. If we look at the nature of the process, there would be two main learning classes. On the one side, the simplest level would be called “learning of Level I” or “Level I learning” and, on the other side, the most complex level would correspond to “learning of Level II” or “Level II learning”. By “learning of Level I” we mean instrumental learning concerned primarily with effectiveness; in other words, how best to achieve existing goals and objectives, keeping organizational performance within the range specified by existing values and norms. In such learning a single feed-back loop

connects detected error to organizational strategies of action. These strategies are modified, in turn, to keep organizational performance within the range set by existing organizational values and norms. On the other hand, by “learning of Level II” we mean learning that results in a change in the values of theory-in-use, as well in its strategies. Strategies may change concurrently with, or as a consequence of, change in values. There is, in this sort of learning, a double feedback loop which connects the detection of error not only to strategies of effective performance but to the values and norms that define effective performance. Level II learning is brought about by the use of heuristics, ability development and (non-routine) insight, it being a more cognitive process than Level I learning, since, operating in an environment of ambiguity and complexity, repetitive behavior would be of little sense. In this level of learning questions on whys are queried. The result of this learning is not a particular behavioral result, but, rather, the development of reference structures or new interpretive schemes (Argyris & Schön, 1996; Fiol & Lyles, 1985).

Likewise, organizational learning is a dynamic capability that integrates, builds and reconfigures competencies to address rapidly changing environments and generates the organization’s capacity to change, and this ability requires the integration of a series of path-dependent factors (e.g., Eisenhardt & Martin, 2000; Teece et al., 1997; Zollo & Winter, 2002). This proposal implies that organizational learning simultaneously integrates a series of strategic factors or capabilities.

Although organizational learning is widely prescribed as a means to improve firms’ performance and innovation, what leads to successful implementation of organizational learning? Our view is that certain factors and capabilities allow firms to develop the capability and that identifying to them will complement the general prescription that firms develop organizational learning. The call to pay more attention to factors and capabilities promoting the development of organizational learning joins calls for empirical exploration of organizational learning’s effect on performance and innovation (e.g., Easterby-Smith et al., 2000; Tsang, 1997). We wish to contribute to filling all these gaps using the levels of learning (Level I and II learning).

In the same way, we should underline the fundamental role of the CEOs. Although numerous actors may be involved in the management process, the CEO is ultimately responsible for plotting out the organization’s direction and plans, as well as being responsible for guiding the actions carried out to achieve them (Westphal & Fredrickson, 2001). Therefore, the CEO’s perception both of the environment surrounding the organization and of the resources and capabilities existing inside it are

primordial for creating organizational learning. In order to make sense of this complex environment surrounding them, managers tend to form simplified internal cognitive representations (mental models). In this sense, personal mastery, shared vision, environment and strategic proactivity are among those most frequently analyzed in the relevant literature on organizational learning (e.g., Fiol & Lyles, 1985; March & Olsen, 1975; Senge, 1990; Senge et al., 1994; Swieringa & Wierdsma, 1992).

It should be mentioned that, on the one hand, organizational learning is different from the sum of the learning of the people who make up the organization and that, on the other, individual learning is a necessary condition but is not enough in itself to guarantee the existence of learning within the organization.

The ultimate purpose of organizational learning is the generation of new knowledge and applications, especially those connected to continuous innovation and improvement (e.g., Cohen & Levinthal, 1990; Leonard-Barton, 1992; Nonaka & Takeuchi, 1995), and many researchers have also claimed a positive relationship between organizational learning and performance (e.g., Argyris & Schön, 1996; Fiol & Lyles, 1985, Inkpen & Crossan, 1995; Senge, 1990). We wish to reinforce this work by contributing to the analysis of the relationships between organizational learning / innovation and organizational performance based on the differentiation of the learning level.

To summarize, this study, based on the nature of the process of organizational learning (Level I and II learning), analyzes the influence of CEO perceptions of several strategic factors and capabilities (personal mastery, shared vision, environment and strategic proactivity) in organizational learning and emphasizes the importance of offering empirical results proving these relationships. We show how personal mastery and a stable environment have a positive and significant impact on Level I learning, and personal mastery, shared vision, dynamic, complex, diverse and hostile environment and strategic proactivity have a positive and significant influence on Level II learning. Finally, we empirically show the existence of a positive and significant link between organizational learning / innovation and organizational performance both for Level I Learning and for Level II Learning. However, organizations with Level II learning show greater organizational innovation and stronger organizational performance.

This article is structured as follows: Based on prior research, Section 2 suggests a series of hypotheses on the influence of CEO perceptions concerning personal mastery, shared vision, environment and strategic proactivity on the level of learning and the influence of these levels on organizational performance and innovation.

Section 3 presents the data and methods used to carry out an empirical exploration of the hypotheses developed in Section 2 in Spanish firms. The results obtained are included in Section 4. Finally, Section 5 offers concluding observations.

2 Hypotheses Development

2.1 Personal mastery

Personal mastery – the fine art of managing your mind and a desire to understand and learn for its own sake – recognizes that organizations advance only through individuals who learn. This personal mastery is based around that part of learning in the learning organization that belongs to the individual, allowing us to clarify and go further into our personal vision. This discipline of personal mastery includes a series of practices, principles and adaptive skills (e.g. raising consciousness or metacognition, using imagery, framing and reframing events or integrating new perspectives, personal vision, creative tension, commitment to truth). Likewise, personal mastery also takes in human resource development (activities and processes which are intended to have an impact on organizational and individual learning).

This personal mastery and self-development means seeking and using feedback, setting development goals, engaging in developmental activities, and tracking progress on one's own. Thus, people are capable not only of monitoring their own behaviors but also of recognizing which behaviors and outcomes are most desirable. Through the discipline of personal mastery the individuals take responsibility for their own learning and the methods they will use to achieve it. Managers with high levels of personal mastery are more committed. They have a broader and deeper sense of responsibility in their work. In this way, they learn and generate learning faster, more profoundly and more generatively (McGill et al., 1992; Senge, 1990; Senge et al., 1994). With all this in mind, we put forward the following hypotheses:

Hypothesis 1a: Personal mastery will be positively related to organizational learning.

Hypothesis 1b: Personal mastery will be positively related to Level I learning.

Hypothesis 1c: Personal mastery will be positively related to Level II learning.

2.2 Shared vision

Personal mastery is the bedrock for developing shared vision. This means not only personal vision, but commitment to the truth and creative tension – the hallmarks of personal mastery. And this shared vision is vital for the learning organization because it provides the focus and energy for learning. This includes a guiding philosophy (or core ideology) and coherent aims of collective aspirations (Collins & Porras, 1991) and it is the result of a creative orientation and a “generative” conversation within an organization (Maani & Benton, 1999). An organization without shared vision cannot create its future; it can only react to it. This vision gives us the strength to express our thoughts, learn from our mistakes, fuelling us for experimentation and innovation (Senge, 1990).

This vision serves to link together the disparity of emerging initiatives and provides coherence to the whole, becoming the main mechanism that makes it possible to bring unity to the diversity sustained in any creative entity.

Shared vision is highly important for organizational learning (Maani & Benton, 1999; Senge, 1990; Senge et al., 1994) especially because it pushes organizational members to work the same way to obtain common objectives (Slater & Narver, 1995). Many works have stated a positive relationship between shared vision and organization learning (e.g., Hodge et al., 1998; Senge, 1990; Senge et al., 1994). On the other hand, the absence of shared vision has been analyzed as one of the most important causes of failure for the processes of organizational learning (Fahey and Prusak, 1998).

If we differentiate on the basis of learning levels, we can state that, while learning of Level I is possible without vision, learning of Level II occurs only when people are striving to accomplish something that matters deeply to them. In fact, the whole idea of learning of Level II – expanding your ability to create – will seem abstract and meaningless until people become excited about some vision they truly want to accomplish (Senge, 1990; Senge et al, 1994). It is the result of a “generative” conversation within an organization (Maani & Benton, 1999). Taking the above into account and in order to analyze the influence of shared vision on organizational learning and on the basis of level of learning, we formulate the following hypotheses:

Hypothesis 2a: Shared vision will be positively related to organizational learning.

Hypothesis 2b: Shared vision will be positively related to Level I learning.

Hypothesis 2c: Shared vision will be positively related to Level II learning.

2.3 Environment

The environment is aligned with the organization and the organization, as a social system, is an ideal environment for learning to exist (DiBella et al., 1996). Learning is the main way in which organizations interact with their environment. Thus, the environment influences learning in different ways. Firstly, it is a facilitator of the information which is the basis for learning. Secondly, the environment is an evaluator of the firm's learning. Finally, the environment is a promoter of the learning process. Depending on the type of environment the organization is up against, one type of learning may be more adequate than the other.

This type of learning is the only way in which a firm can successfully adapt to this type of environment. Based on the above, we propose the following hypotheses:

Hypothesis 3a: Environment will be positively related to organizational learning.

Hypothesis 3b: Well-understood environment will be positively related to Level I learning.

Hypothesis 3c: Ambiguous environment will be positively related to Level II learning.

2.4 Strategic proactivity

In the proactive approach, the concept of organizational learning is linked to the organization's capacity to transform itself and change, the learning organization being identified with that type of organization that is capable of bringing about its own transformation and change (e.g., Kim 1993; Swieringa & Wierdsma, 1992). These organizations do not simply adapt to their environment but, in addition to this, are capable of causing their own change and, thus, influencing that environment (learning of Level II). They have the potential to expand their learning capability, promoting their development and growth (Senge, 1990). Here we are dealing with proactive systems, in that the change is induced by the organization itself and not by pressure exerted from the environment.

On the basis of all this, we propose that strategic proactivity will have a positive influence on organizational learning, Level I and Level II learning. Hypothesis 4b has been included to empirically check whether there is a positive and significant relationship between strategic proactivity and Level I learning, in spite of the fact that

prior theoretical research (e.g., Argyris & Schön, 1996; Senge et al., 1994) denies that such a link exists. Thus, we propose:

Hypothesis 4a: Strategic proactivity will be positively related to organizational learning.

Hypothesis 4b: Strategic proactivity will be positively related to Level I learning.

Hypothesis 4c: Strategic proactivity will be positively related to Level II learning.

2.5 Organizational innovation

The wide and diverse literature on organizational innovation has received important contributions from works on organizational learning since the last decade. Many of these contributions have noted a positive relationship between organizational learning and innovation (e.g., Tushman & Nadler, 1986). Organizational learning supports creativity, inspires new knowledge and ideas, and increases the potential to understand and apply them (Damanpour, 1991).

The organizational knowledge creation process by which new knowledge is drawn from existing knowledge (organizational learning) is the corner stone of innovative activities. It is the process itself that strengthens innovation and not knowledge in itself (Nonaka & Takeuchi, 1995). Furthermore, organizational innovation is dependent on the organization's knowledge base, which, in turn, is promoted by organizational learning (Cohen & Levinthal, 1990). Thus:

Hypothesis 5a: Organizational learning will be positively related to organizational innovation.

Hypothesis 5b: Level I learning will be positively related to organizational innovation.

Hypothesis 5c: Level II learning will be positively related to organizational innovation.

2.6 Organizational performance

The learning processes have an effect on organizational performance (Blazevic & Lievens, 2004; Hult et al., 2002). For this reason, in spite of the fact that the relationship between both concepts is complex, most organizations nowadays are attempting to perfect it and improve their results through learning. However, empirical

analysis of this relationship has been limited. Some recent works have begun to verify this positive relationship (e.g., Bontis et al., 2002; Schroeder et al., 2002; Zahra et al., 2000). We propose:

Hypothesis 6a: Organizational learning will be positively related to organizational performance.

Hypothesis 6b: Level I learning will be positively related to organizational performance.

Hypothesis 6c: Level II learning will be positively related to organizational performance.

3 Data and methods

3.1 Sample selection

The population for this study consisted of companies with the highest turnover in Spain and which belong to the four sectors we aim to examine (food-farming, manufacturing, construction and services) according to the Dun and Bradstreet Spain (2000) database. We randomly drew a sample of 900 organizations from this source.

Table 1. Technical details of the research

Sectors	Food-farming, manufacturing, construction and services
Geographical location	Spain
Methodology	Structured questionnaire
Procedure	Stratified sample with proportional allocation (sectors and size)
Universe of population	50,000 companies
Sample (response) size	900 (402) companies
Sample Level I/II organizations	239 companies
Sample (Level I/II organizations) error	4.8% (6.3%)
Confidence level	95 percent, $p-q=0.50$; $Z=1.96$
Period of collecting data	From September to December, 2001

We initially carried out interviews with some CEOs (the informants who were most able to observe and to determine the impacts of the studied variables on the rest of the organizations' activities), consultants and academics interested in organizational learning. After the interviews, we drew up a structured questionnaire to better understand how CEOs face learning issues. We omitted the responses of the interviewees in this first stage from the subsequent analysis of the survey data. Thus, 900 questionnaires were sent out and 420 of those questionnaires were responded to.

Due to missing values, only 402 questionnaires were included in the research as having been fully filled out, which gave an approximate response rate of 45 percent (Table 1). A series of chi-square and t-tests revealed no significant differences between the characteristics of firm respondents and non-respondents. Likewise, we did not find significant differences in terms of type of business or size. Furthermore, since all measures were self-reported assessments of single respondents, common method bias could have augmented relationships between the variables. However, if this were a problem, we would have obtained a single general factor to account for most of the covariance in the dependent and independent variables (Podsakoff & Organ, 1986). We performed Harman's one-factor test on items included in our regression models and found no general factor. Additionally, an advantage of the moderated regression analysis is that common method effects are partialled out, along with main effects, before one inspects an interaction term (Pierce et al., 1993). Based on a series of items, which will be analyzed subsequently, we obtained a sample of 239 organizations that responded to a learning of Level I or learning of Level II.

3.2 Measures

Personal mastery. Following the same lines as those of prior research studies, which have developed reliable valid scales for measuring personal mastery (e.g., Gardiner & Whiting, 1997) we drew up a five-item scale that includes three items from Edmondson (1999) and another two based on theory. We developed a confirmatory factor analysis in order to validate our scale, indicating deletion of item 2. After this deletion, item loadings were proposed significant, showing evidence for convergent validity and high reliability ($\alpha = .849$).

Shared vision. Based on the scales proposed in previous research studies (e.g., Jehn, 1995; Oswald et al., 1994; Tsai & Ghoshal, 1998) in a context similar to ours, we drew up a three-item scale. We developed a confirmatory factor analysis in order to validate our scale, which showed that the scale had a good reliability ($\alpha = .767$).

Environment. Based on the proposals put forward by Dess and Beard (1984) and Tan and Litschert (1994), we used six items in the questionnaire that were adapted from the scale the aforementioned authors worked with. These items attempted to measure the dimension of the dynamism, the complexity, the diversity, the heterogeneity and the munificence/hostility of the environment. We initially re-coded the responses obtained to the first, second and fifth questions in order to homogenize them in the same sense and avoid any possible bias in the data treatment. We developed a confirmatory factor

analysis in order to validate our scale, indicating deletion of items 5 and 6. The scale had a good reliability ($\alpha = .686$).

Strategic proactivity. Using the strategic typology of Miles and Snow (1978) three items were taken to measure the business, technological and administrative dimensions. The scale was established in a similar way to that used by Shortell and Zajac (1990), where the lowest values (1) correspond to the attributes of the reactive firms and the highest (7) to the proactive firms. We developed a confirmatory factor analysis in order to validate our scale, indicating deletion of item 3. This procedure allowed us to choose two items with an adequate reliability ($\alpha = .610$).

Organizational learning. Due to its extremely close relationship to our work, to the fact that it reflected the different prior trends well (e.g., Edmondson, 1999; Jerez-Gómez, et al., 2004) and to that it had been carefully validated, we used the first two items of the scale developed by Kale, Singh and Perlmutter (2000). These items have been duly adapted to this study in particular, including two additional items drawn up using the prior theoretical overview carried out. We developed a confirmatory factor analysis in order to validate our scale and showed that the scale had a high reliability ($\alpha = .918$).

Level I or level II learning. Based on the prior research done by different authors (e.g., Argyris & Schön, 1978; Fiol & Lyles, 1985; McGill et al., 1992; Senge, 1990; Swieringa & Wierdsma, 1992) we used four items to determine whether the organization encouraged a Level I or Level II learning. The scale was established in such a way that the lowest values (1) correspond to the attributes of the Level I learning and the highest (7) to the Level II learning. We developed a confirmatory factor analysis in order to validate our scale, indicating deletion of item 4. This procedure allowed us to choose three items with an adequate reliability ($\alpha = .794$). The organizations that showed low values in the three items have been classified as Level I organizations, while those with high values have been considered as Level II organizations. There are organizations that are undergoing a process of transformation from Level I learning to Level II, showing average or high, and also low, values in the questions posed. The objective of our research is to analyze the effects or consequences of these two learning levels and, therefore, we have used a sample formed by organizations that respond clearly to the profile of either learning of Level I or of Level II.

Organizational innovation. Previously measured aspects of innovation concern those related to organizational process, organizational timing, and human resource

management processes. We based our scale on Miller and Friesen's work (1983) and defined innovation for respondents, noting that organizational innovation, not industry or market innovation, should be their focus and asking them, in the time-scale of the past three years, both to evaluate innovation on products or services and internal operating practices and to compare their firms with competitors in terms of innovation. We developed a confirmatory factor analysis in order to validate our scale and showed that the scale had a high reliability ($\alpha = .766$). We also included questions so that the managers could offer precise quantitative data on organizational innovation and innovation radicality. When possible, we calculated the correlation between the objective and subjective data, and these were high and significant.

Organizational performance. Having reviewed how performance is measured in different pieces of strategic research work (e.g., Hansen, 2004; Homburg et al., 1999; Venkatraman & Ramanujan, 1986) a Likert-type scale was drawn up, which included eight items that measured organizational performance. The use of scales in which performance is evaluated in comparison with the main competitors is one of the most widely-used practices in recent studies (Steensma & Corley, 2000).

Many researchers have used subjective perceptions of managers to measure beneficial outcomes for firms and others have preferred objective data, such as return on assets. In principle, objective measurements have a greater validity, although it has been widely demonstrated in the literature that there is a high correlation and concurrent validity between the objective and subjective measurements of performance, which means that both are valid when establishing a firm's performance (Homburg et al., 1999). We included questions tapping both types of assessment in our interviews, but the managers were more open to offering their general views than to offering precise quantitative data (only 47% did so). When it was possible, we calculated the correlation between the objective and subjective data, and these were high and significant. We developed a confirmatory factor analysis in order to validate our scale and showed that the scale had a high reliability ($\alpha = .860$). A Likert-type 7-point scale (1 "*totally disagree*", 7 "*totally agree*") was used in the previous variables (except for strategic proactivity and level of learning) for managers to express their level of agreement or not.

Size. As the control variable, we used size in terms of number of employees. The specialized literature considers size to be one of the factors that may affect organizational learning (e.g., DiBella et al., 1996; Tsang, 1997). However, there is nothing to say that learning should be exclusively a phenomenon of large firms (McGill

& Slocum, 1993). Table 2 shows the selected items checking the existence of validity and reliability of the measurement scales.

Table 2. Validity, reliability and internal consistency of scales

	Items	λ^*	Standardized Errors	R^2	Alpha of Cronbach	Adjustment Measurement
Personal Mastery	PERSONAL1	0.87*** (25.48)	0.24	0.76	0.8490	Composed Reliability = 0.937
	PERSONAL3	0.90*** (27.65)	0.19	0.81		
	PERSONAL4	0.93*** (25.11)	0.13	0.87		Extracted Variance = 0.789
	PERSONAL5	0.85*** (28.57)	0.28	0.72		
Shared Vision	SHAREDVIS1	0.75*** (20.50)	0.44	0.55	0.7674	Composed Reliability = 0.806
	SHAREDVIS2	0.87*** (21.81)	0.25	0.75		Extracted Variance = 0.583
	SHAREDVIS3	0.70*** (14.04)	0.52	0.45		
Environment	ENVIRONMENT1	0.69*** (9.90)	0.52	0.48	0.6868	Composed Reliability = 0.812
	ENVIRONMENT2	0.69*** (10.55)	0.52	0.48		Extracted Variance = 0.521
	ENVIRONMENT3	0.77*** (14.97)	0.40	0.60		
	ENVIRONMENT4	0.73*** (13.30)	0.47	0.53		
Organizational Learning	OL1	0.94*** (49.27)	0.11	0.89	0.9181	Composed Reliability = 0.931
	OL2	0.90*** (28.50)	0.18	0.82		Extracted Variance = 0.774
	OL3	0.83*** (20.91)	0.31	0.69		
	OL4	0.84*** (22.64)	0.30	0.70		
Organizational Innovation	INNOVA1	0.70*** (10.65)	0.51	0.49	0.7661	Composed Reliability = 0.791
	INNOVA2	0.86*** (12.93)	0.26	0.74		Extracted Variance = 0.561
	INNOVA3	0.67*** (11.06)	0.54	0.46		
Organizational Performance	PERFORMANCE1	0.95*** (46.52)	0.11	0.89	0.8605	Composed Reliability = 0.973
	PERFORMANCE2	0.98*** (49.01)	0.03	0.96		
	PERFORMANCE3	0.85*** (31.88)	0.29	0.71		
	PERFORMANCE4	0.83*** (34.62)	0.31	0.69		Extracted Variance = 0.822
	PERFORMANCE5	0.90*** (36.77)	0.18	0.82		
	PERFORMANCE6	0.90*** (42.44)	0.19	0.81		
	PERFORMANCE7	0.90*** (34.68)	0.18	0.82		
	PERFORMANCE8	0.94*** (42.90)	0.12	0.88		
Level Learning	LEVELEARN1	0.78*** (64.07)	0.39	0.61	0.7943	Composed Reliability = 0.821
	LEVELEARN2	0.74*** (10.48)	0.45	0.55		Extracted Variance = 0.605
	LEVELEARN3	0.81*** (16.57)	0.34	0.66		

4 Results

Firstly, in Tables 3 and 4 we have reflected the means, standard deviations, and inter-factor correlations matrix, with the aim of evaluating the significance level of the relationships that exists.

Table 3. Descriptive statistics of firms with Level I learning

Measure	Mean s	S.D.	Correlation							
			1	2	3	4	5	6	7	
(1) Personal Mastery	5.401	0.952	1.000							
(2) Shared Vision	5.040	1.113	0.508***	1.000						
(3) Environment	4.613	1.162	0.113	-0.011	1.000					
(4) Strategic Proactivity	4.265	1.572	0.243*	0.188 [†]	0.234*	1.000				
(5) Organizational Learning	5.117	1.216	0.304**	0.193 [†]	0.277*	0.199 [†]	1.000			
(6) Organizational Innovation	4.210	1.135	0.281**	0.166	0.271*	0.304**	0.516***	1.000		
(7) Organizational Performance	4.742	0.967	0.447***	0.410**	0.042	0.160	0.399***	0.338**	1.000	

N = 116.

[†] $P < 0.1$.* $P < 0.05$.** $P < 0.01$.*** $P < 0.001$.**Table 4.** Descriptive statistics of firms with Level II learning

Measure	Means	S.D.	Correlation							
			1	2	3	4	5	6	7	
(1) Personal Mastery	5.608	0.824	1.000							
(2) Shared Vision	5.336	1.019	0.557***	1.000						
(3) Environment	5.146	0.993	0.310***	0.182*	1.000					
(4) Strategic Proactivity	5.000	1.415	0.118	0.208*	0.114	1.000				
(5) Organizational Learning	5.622	1.032	0.440***	0.498***	0.317***	0.409***	1.000			
(6) Organizational Innovation	4.822	1.182	0.357***	0.411***	0.218**	0.451***	0.566***	1.000		
(7) Organizational Performance	4.923	0.966	0.358***	0.473***	0.090	0.300***	0.499***	0.544***	1.000	

N = 123.

[†] $P < 0.1$.* $P < 0.05$.** $P < 0.01$.*** $P < 0.001$.

The correlations among organizations with learning of Level I and Level II have been separated. In both cases there are significant and positive correlations between personal mastery, shared vision, environment, strategic proactivity, organizational innovation and organizational performance and the main construct of study, organizational learning. These correlations are usually more substantial in organizations with learning of Level II than organizations with learning of Level I. As these tables show, none of the correlations has a value that is very close to 1, indicating that no multicollinearity will initially come up. Afterwards, this was verified by calculating a series of tests (e.g. tolerance, variance inflation factor) for each regression model showing the non-presence of multicollinearity (Hair et al., 1999).

Table 5. Independent samples T-test (Level II-Level I)

Measure	Means		Levene's test for equality of variances		T-test for equality of means	
	Learning Level – II	Learning Level – I	F	Sig.	t	Sig. (two-tailed)
Personal Mastery	5.608	5.401	2.526	0.113	1.745 [†]	0.082
Shared Vision	5.336	5.040	2.882	0.091	2.269*	0.024
Environment	5.146	4.613	3.280	0.071	3.712***	0.000
Strategic Proactivity	5.000	4.265	2.877	0.091	3.647***	0.000
Organizational Learning	5.622	5.117	2.564	0.111	3.377**	0.001

[†] $P < 0.1$.

* $P < 0.05$.

** $P < 0.01$.

*** $P < 0.001$.

Secondly, we carried out a T-test for equality of means among organizations with learning of Level I and Level II to analyze whether there are significant differences concerning the practices related to personal mastery, shared vision, environment, strategic proactivity and organizational learning. The results of these tests can be seen in Table 5. For each construct, the table provides the mean score, the Levene's test for equality of variances and the T-value. We observe significant differences between all the constructs, a reflection of the differing impact of these strategic factors on the level of learning. Thus, the Level II organizations usually have a greater degree of personal mastery, more shared vision, are immersed in dynamic and ambiguous contexts and do not only seek to adapt to the environment, but also are capable of bringing about their own change. In short, it can be seen that the mean scores of these strategic factor for Level II organizations are higher than those for Level I organizations.

Table 6. Regression analysis

Indep. Variables	Mod. Level - II	Mod. Level - I	Mod. Total
Personal Mastery	0.217** (2.641)	0.234 [†] (1.871)	0.199** (2.903)
Shared Vision	0.259* (2.276)	0.082 (0.659)	0.196** (2.876)
Environment	0.181** (2.576)	0.246* (2.275)	0.229*** (3.890)
Strategic Proactivity	0.314*** (4.644)	0.075 (0.676)	0.226*** (3.845)
Size	-0.017 (-0.249)	-0.133 (-1.240)	-0.054 (-0.948)
R	0.644	0.426	0.565
R ²	0.415	0.182	0.319
R ² adjusted	0.393	0.127	0.304
F	19.118***	3.329**	20.260***
Std. Error	0.797	1.146	0.941

[†] $P < 0.1$.

* $P < 0.05$.

** $P < 0.01$.

*** $P < 0.001$.

Thirdly, regressions analyses were made both in overall terms and among the groups of firms with learning of Level I and Level II. For the analysis, organizational

learning was taken as the dependent variable, while the predictor variables were personal mastery, shared vision, environment and strategic proactivity. Size was taken as the control variable. The results can be seen in Table 6. Overall, the determination coefficient (R^2) was 0.319 ($F = 20.260$, $p < 0.001$), with significant t-student values for the variables of personal mastery ($\beta = 0.199$, $p < 0.01$), shared vision ($\beta = 0.196$, $p < 0.01$), environment ($\beta = 0.229$, $p < 0.001$) and strategic proactivity ($\beta = 0.226$, $p < 0.001$). In the case of the Level I firms group, the determination coefficient (R^2) was 0.182 ($F = 3.329$, $p < 0.01$), with significant t-student values in the case of the parameters for the variables of personal mastery ($\beta = 0.234$, $p < 0.10$) and environment ($\beta = 0.246$, $p < 0.05$). The parameters of shared vision and strategic proactivity did not take significant values for the t-student. In the group of Level II firms, the determination coefficient (R^2) was 0.415 ($F = 19.118$, $p < 0.001$), with significant t-student values for the variables of personal mastery ($\beta = 0.217$, $p < 0.01$), shared vision ($\beta = 0.259$, $p < 0.05$), environment ($\beta = 0.181$, $p < 0.01$) and strategic proactivity ($\beta = 0.314$, $p < 0.001$). Size did not turn out to be significant for any of the models established, which reflects the fact that organizational learning can occur in both large and small firms.

From the results obtained, it can be deduced that people are the basis and the principle of all business competences and, therefore, we should boost their personal mastery in all cases (Senge, 1990; Senge et al., 1994). To do this, managers need to commit themselves openly to personal and professional development both for them and for the other members of the organization. Although the leaders cannot force the personal growth of others, they can become a source of energy through their personal example and the promotion of a climate that favors personal mastery and in which the idea that the organization constantly seeks personal growth is reflected. For this reason, personal mastery can have a positive and significant influence on organizational learning, considered both in overall terms and when differentiating on the basis of learning level. This means that hypotheses 1a, 1b and 1c are supported.

The results of the research have revealed how, overall, shared vision is vital for organizational learning, supporting hypothesis 2a. However, if we differentiate in terms of learning level, a positive and significant relationship is shown between shared vision and learning of Level I, but not between this and learning of Level II, providing support for hypothesis 2c but not for 2b. As we already mentioned, this is coherent with prior theory, since shared vision is a discipline that entails notions of generative learning, closely linked to Level II learning but not so much to Level I (Maani & Benton, 1999;

Senge, 1990; Senge et al., 1994). It was observed as the result of a generative process (Maani & Benton, 1999).

Likewise, the environment is positively related to learning. This organizational learning prepares the organization for capturing possible future opportunities and there is a positive relationship, as the results obtained have demonstrated, thus supporting hypothesis 3a. The results of the regressions analyses and the T-test for equality of means also reveal that this environment has an impact both on Level I and Level II learning, the former being more suitable in relatively static environments and the second when the environment begins to become somewhat complex and dynamic (McGill et al., 1992; Senge, 1990), thus supporting hypotheses 3b and 3c.

The fact that the organization's strategic approach influences learning was also verified, providing a context for the perception and interpretation of the environment (Cyert & March, 1963; Fiol & Lyles, 1985). The research results have provided support for hypothesis 4a; that is, one of the key attributes of the intelligent organization is the conception of strategic proactivity as an integral part of the organizational learning process. Distinction on the basis of the type of learning enables us to verify that Level I organizations associate organizational learning with the knowledge and experience generated in the interaction with the environment and thanks to which they adapt their actions to that environment. Meanwhile, Level II organizations do not merely adapt to the environment, but they also have the capability to promote change, which means there is a positive and significant relationship between Level II learning and strategic proactivity, giving support to hypothesis 4c. The link between learning of Level I and strategic proactivity is not significant and so there is no support for hypothesis 4b, which referred to a positive and significant relationship between both. This result is in keeping with prior theoretical research (e.g., Argyris & Schön, 1996; Senge et al., 1994).

Table 7. Influence of organizational learning on organizational innovation and organizational performance

Dep. Variable		Mod. Level – II	Mod. Level – I	Mod. Total
Organizational Innovation	β	0.566***	0.516***	0.569***
	t	(8.418)	(5.424)	(10.560)
	R	0.566	0.516	0.569
	R ²	0.321	0.266	0.324
	R ² adjusted	0.316	0.257	0.321
	F	70.867***	29.423***	111.509***
	Std. Error	0.977	0.984	0.990
Organizational Performance	β	0.499***	0.399***	0.466***
	t	(6.881)	(3.868)	(7.884)
	R	0.499	0.399	0.466
	R ²	0.249	0.159	0.217
	R ² adjusted	0.244	0.149	0.214
	F	47.355***	14.962***	62.150***
	Std. Error	0.840	0.894	0.859

† $P < 0.1$.* $P < 0.05$.** $P < 0.01$.*** $P < 0.001$.

Finally, regression analyses were made in overall terms and also between Level I and Level II firms both for organizational performance and for organizational innovation. The results can be seen in Table 7. Firstly, organizational innovation was taken as the dependent variable, while the predictor variable was organizational learning. Overall, the determination coefficient (R^2) was 0.324 ($F = 111.509$, $p < 0.001$), with a significant t-student value in the case of organizational learning ($\beta = 0.569$, $p < 0.001$). It was checked that, for organizational innovation to arise, the existence of learning capability is required (Nonaka & Takeuchi, 1995), which provides support for hypothesis 5a. In the case of the Level I firms group, the determination coefficient (R^2) was 0.266 ($F = 29.423$, $p < 0.001$), with a significant t-student value in the case of organizational learning ($\beta = 0.516$, $p < 0.001$). In the group of Level II firms the determination coefficient (R^2) was 0.321 ($F = 70.867$, $p < 0.001$), with a significant t-student value also for the variable of organizational learning ($\beta = 0.566$, $p < 0.001$). Thus, the results enable us to accept both hypotheses 5b and 5c. Analyzed in more detail, significant differences have been found between the degree of innovation radicality depending on the learning level ($t = 11.579$, $p < 0.001$). The innovations produced by learning of Level I respond to incremental innovations, which give rise to a small deviation from existing practices, while those generated by learning of Level II are radical innovations, bringing about fundamental changes in the organization's activities and representing clear deviations from existing practices (Forrester, 2000; Damanpour, 1991).

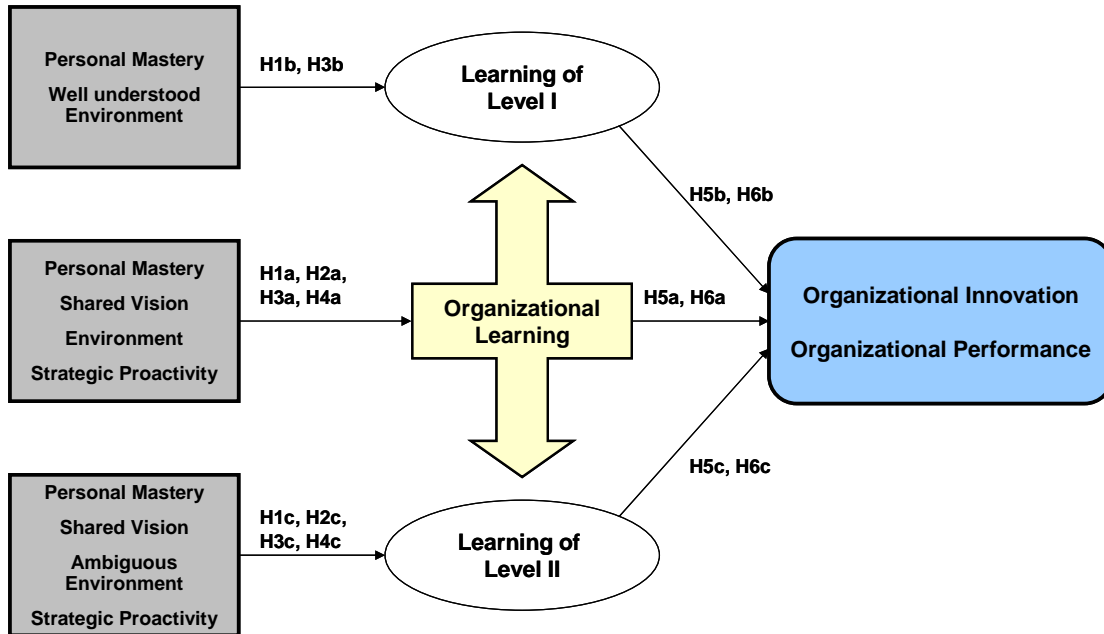


Fig. 1. Organizational learning on the basis of level of Learning: Hypotheses supported

Secondly, organizational performance was taken as the dependent variable, while the predictor variable was organizational learning. Organizations that learn and, moreover, learn fast, have a greater strategic capacity to maintain an advantageous competitive position and achieve better results (Bontis et al., 2002; Schroeder et al., 2002; Zahra et al., 2000). This study has empirically proved the presence of an important link between organizational learning and organizational performance. The determination coefficient (R^2) was 0.217 ($F = 62.150$, $p < 0.001$), with a significant t-student value in the case of organizational learning ($\beta = 0.466$, $p < 0.001$), providing support for hypothesis 6a. If we differentiate on the basis of learning level, we can observe how, in the case of the Level I firms group, the determination coefficient (R^2) was 0.159 ($F = 14.962$, $p < 0.001$), with a significant t-student value in the case of organizational learning ($\beta = 0.399$, $p < 0.001$) and in the group of Level II firms the determination coefficient (R^2) was 0.249 ($F = 47.355$, $p < 0.001$), with a significant t-student value also for the variable of organizational learning ($\beta = 0.499$, $p < 0.01$). The results show us that organizational learning has a greater influence on business performance in the case of organizations with learning of Level II than in the Level I organizations. Level I learning leads to a betterment of day-to-day work and Level II learning produce improvement in organizational competitiveness and greater profits. Hypotheses 6b and 6c are supported. The hypotheses supported can be seen in Figure 1.

5 Conclusions

This investigation has aimed to identify empirically the impact of the manager's perception of various strategic factors and capabilities promoting the development of organizational learning and organizational learning's effect on organizational performance and innovation, differentiating on the basis of learning level. The empirical study has enabled us to examine two samples, one concerning the organization with learning of Level I and another including those with learning of Level II.

The analysis of the results has enabled us to support that personal mastery is an essential capability for generating learning within the organization, enabling us to learn to generate and sustain creative tension. Encouraging the discipline of personal mastery and development is essential for both levels of learning since it is the basis and the principle of different business competences. Thus, promoting a climate that favors personal mastery will facilitate the existence of innovation and continuous organizational learning through the generation and sustaining of creative organizational tension (Senge, 1990). In turn, shared vision is one of the guiding elements in intelligent organizations. When people truly share a vision they are connected, bound together by a common aspiration. A shared vision uplifts people's aspirations (Senge, 1990; Senge et al., 1994). Work becomes part of pursuing a large purpose embodied in the organizations' products or services, accelerating learning and innovation. It responds to a creative orientation and a generative conversation within an organization, being strongly linked to learning of Level II. However, learning of Level I is possible without shared vision, as has been revealed in this research.

Likewise it is shown that Level II learning is more adequate when tackling the current turbulence that exists in the organizational environment and which is constantly changing, since, when operating in areas of ambiguity and complexity, behaviors that simply improve the existing competences and procedures would be of little use (Argyris & Schön, 1978; Slater & Narver, 1995; Senge, 1990). For this reason, and in order to obtain competitive advantage, actions should be proactive and not simply reactive. This is achieved with learning of Level II. Nonetheless, in a stable environment, a Level I learning without strategic proactivity may be adequate, since it allows the existing competences to be improved, enabling the organizations to continue with their pattern of past success so long as the competitive environment remains relatively static (Lant & Mezias, 1992). It should be mentioned that, if the environment were excessively complex and dynamic, the learning would also be much more difficult, since such an environment would prevent the firm from establishing an adequate cause-effect

relationship; that is, a relationship between actions and results (Daft & Weick, 1984), and the learners would not be able to plot the correct map so as to analyze their environment (March & Olsen, 1975). Thus, personal mastery, shared vision, ambiguous environment and strategic proactivity have a positive and significant influence on the presence of Level II learning, while personal mastery and well-understood environment have a positive and significant effect on Level I learning.

Our study, likewise, empirically demonstrates that both forms of learning are necessary and generate an increase in performance and innovation. However, we should not forget that Level II learning is helping towards breaking down probably obsolete structures generating radical innovations and allowing more competitive advantages to be obtained than is the case in Level I learning. This Level II learning permits internal reflection, reduces defensive organizational routines and increases the capability to tackle new organizational challenges (Argyris, 1990, 1993).

In short, organizations should promote learning of Level II. However, this is very difficult to implement in firms, since leaders are needed that will model, use and recompense it, especially under embarrassing circumstances. Furthermore, there are norms that are wedged in among the norms that forbid double-cycle learning. Thus, for example, there could be deeply-rooted norms that go against the more visible norms or “self-reinforcing” cycles and which cause any errors in action to bring individuals round to using conducts that just reinforce these errors. This is what is called learning-inhibiting loops. When these norms exist, wedged among the norms that forbid learning of Level II, it is almost impossible to generate this level of learning.

Thus, if we wish an organization to move from Level I to Level II learning, maps of action should firstly be designed that enable the firm to deal adequately with the problems that are preventing this transformation. These maps of action provide the basis for the necessary organizational change and attempt to discover the organizational context that is blocking out Level II learning. Following this, an effort should be made to re-educate the organization’s members so that they can use this level of learning. This re-education should begin at top-management level, proving to the rest that we can and must learn generatively (Argyris, 1990).

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