

# BUSINESS RESEARCH QUARTERLY

[www.elsevier.es/brq](http://www.elsevier.es/brq)



## ARTICLE

# Training and performance: The mediating role of organizational learning



María Isabel Barba Aragón\*, Daniel Jiménez Jiménez, Raquel Sanz Valle

*Universidad de Murcia, Departamento de Organización de Empresas y Finanzas, Facultad de Economía y Empresa, Campus de Espinardo, Murcia, Spain*

Received 20 November 2012; accepted 27 May 2013

Available online 13 August 2013

## JEL CLASSIFICATION

M12;  
M53;  
K

## KEYWORDS

Training;  
Performance;  
Organizational  
learning;  
Mediation

**Abstract** Although there is a general recognition in the literature that training improves a firm's performance, empirical research does not always provide evidence to support this effect. One possible explanation is that training does not have a direct effect on performance but an indirect effect by improving other organizational outcomes. This paper suggests that organizational learning is one of those variables and that it mediates the relationship between training and performance and that the adoption of a learning-oriented training enhances performances through its positive effect on organizational learning. Using a sample of Spanish firms we obtain empirical evidence, which supports the view that this mediating effect is present.

© 2012 ACEDE. Published by Elsevier España, S.L. All rights reserved.

## 1. Introduction

The study of the relation between training and firm's performance has occupied a good amount of research during the last decades. In general, literature considers that training improves organizational performance by creating a workforce with extensive knowledge and skills (Kraiger, 2003; Tharenou et al., 2007; Ballesteros et al., 2012). The idea

underlying this assumption is that training plays a key role in enhancing two of the main sources of competitive advantage for the firm: its human capital and its organizational knowledge (Aragon et al., 2003; Subramaniam and Youndt, 2005; Lopez-Cabrales et al., 2006).

Despite the presumed positive effect of training on all levels of organizational outcomes: individual and team, organizational and social (Aguinis and Kraiger, 2009), the empirical research focusing on the training-performance link does not always provide evidence to support such a relationship.

A number of reasons have been put forward to explain why some studies do not find any empirical support for the positive relationship between training and performance.

\* Corresponding author.

E-mail addresses: [isabarba@um.es](mailto:isabarba@um.es) (M.I. Barba Aragón), [danieljj@um.es](mailto:danieljj@um.es) (D. Jiménez Jiménez), [raquel@um.es](mailto:raquel@um.es) (R. Sanz Valle).

The literature usually highlights a likely lag effect in the relationship between human resource management (HRM) practices, training being one of them, and performance (Guest, 2001; Wright et al., 2001; Collins and Clark, 2003; Wall and Wood, 2005). For instance, Guest (2001) considers the implementation of any HRM practice requires of the appropriate time lag before it and that "it may be quite a long time".

Other explanation is that training may not have a direct effect on performance, but an indirect effect by improving employees' performance and other organizational outcomes. However, only a few papers have studied empirically whether the relationship between training and performance is mediated by other variables. One of them is the research of Ahmad and Schroeder (2003). They find that training in job related skills and cross-training have an indirect effect on operations performance through its effect on organizational commitment. Gelade and Ivery (2003) provide evidence that work climate mediates the relationship between training and the unit performance. And, Faems et al. (2005) find that the link between training and performance is mediated by productivity.

This paper focuses on the mediating role of organizational learning between training and performance. There are several reasons for this focus. First, the literature highlights the vital role of organizational learning in a firm's success (Nevis et al., 1995; Brockmand and Morgan, 2003). Second, some studies suggest that training is a key tool for improving organizational learning (Garvin, 1993; Nonaka and Takeuchi, 1995; Jerez Gomez et al., 2004). Finally, to date, the linkages between training, organizational learning and performance have hardly been examined together in the literature, particularly from an empirical perspective.

The paper begins with a review of the relevant literature about the relationships between training, organizational learning and performance. Then it proposes a model which links these three variables. Then, the model is tested using a sample of 832 Spanish companies. Finally, the findings are presented along with the managerial implications of the study, its limitations and recommendations for future research.

## 2. Theoretical background and hypotheses

### 2.1. Organizational learning and performance

In general, organizational learning (OL) is conceived as "a principal means of achieving the strategic renewal of an enterprise" (Crossan et al., 1999). There is also a general agreement that OL is a multidimensional concept (i.e., Senge, 1990; Slater and Narver, 1994, 1995; Jerez Gomez et al., 2004; Chiva et al., 2007; Tohidi et al., 2012). In this line, Slater and Narver (1994) asserted that "organizational learning is a complex, multidimensional construct occurring at different cognitive levels ... and encompassing multiple sub processes". However, since different perspectives have been adopted to study OL, dimensions identified within this concept differ (Chiva et al., 2007). In general, two main approaches have been adopted in the field of OL (Tsang, 1997). One of them defines OL as a process by which the organizations learn and develops new knowledge (Huber,

1991; Slater and Narver, 1995; Jiménez and Sanz, 2006; Jyothibabu et al., 2010; Flores et al., 2012). This process, following Huber (1991), is integrated by another four sub-processes: knowledge acquisition, distribution, interpretation and memory. Each of these sub-processes is therefore taken as a dimension of the OL concept (Chiva et al., 2007).

The second approach defines OL as the organizational orientation to learn or as an organizational capability that facilitates the OL process (Garvin, 1993; Jerez Gomez et al., 2004; Chiva et al., 2007; Camps and Luna-Aroca, 2012). In this line, Garvin (1993) suggests that a "learning organization is an organization skilled in creating, acquiring and transferring knowledge and at modifying its behavior to reflect new knowledge and insights". Thus, the organizational learning capability can be defined as the organizational and managerial characteristics that facilitate the organizational learning process or allow an organization to learn (Chiva et al., 2007; Tohidi et al., 2012). From this perspective, the dimensions of the OL concept are its main facilitators (Chiva et al., 2007).

This paper adopts this second approach and considers OL as an organizational capability which facilitate the organizational learning process, that is to say the "process of change in individual and shared thought and action, which is affected by and embedded in the institutions of the organization" (Crossan et al., 1999).

No matter the approach adopted, there is a growing consensus in the field that OL conceptualizations need to consider multiple levels of analysis within the enterprise: individual, group and organization (Slater and Narver, 1994; Ahmed et al., 1999; Crossan et al., 1999; Bontis et al., 2002; Bapuji and Crossan, 2004; Bell et al., 2010; Jyothibabu et al., 2010).

Individual level learning refers to the process by which individuals generate new insights and knowledge from existing tacit or explicit information and knowledge. From a capability approach, individual learning capability refers to the individuals' competencies and motivation to learn (Bontis et al., 2002) and it is reflected in some individual behaviors such as experimentation, generation of new insights, be aware of critical issues that affect ones work, have a sense of pride and ownership in one's work, etc. (Bontis et al., 2002).

Group level learning involves individuals transferring their individual knowledge within a group so that all members develop a shared understanding (Huber, 1991; Crossan et al., 1999; Kiessling et al., 2009). Dialog and joint action, which are elements that describe the effective work of groups, are crucial in knowledge transfer within a group (Senge, 1990; Crossan et al., 1999; Bontis et al., 2002).

Finally, organizational level learning occurs when individual and group knowledge is institutionalized (Crossan et al., 1999). In other words, it involves "embedding individual and group learning into the non-human aspects of the organization including systems, structures, strategy, culture and procedures" (Bontis et al., 2002).

Although the three levels of learning – individual, group and organizational – are distinct, they are interrelated. Individual learning is considered to be a prerequisite for organizational learning (Kim, 1993; Nonaka and Takeuchi, 1995; Popadiuk and Choo, 2006) because "organizations

learn only thought individuals who learn” (Senge, 1990). But individual learning does not guarantee organizational learning. The latter requires, on the one hand, that individuals share their knowledge within the firm, which needs that groups have the capability of working effectively, and on the other hand, that the firm is able to embed individual and group learning into organizational routines, practices and beliefs that outlast the presence of originating individual (Attewell, 1992). Having these storehouses of knowledge enables the organization “to benefit from past learning even though individuals who have contributed to the learning leave” (Crossan et al., 1999) and, furthermore, it provides a context which guides the actions of organizational members and facilitates interaction among them (Crossan et al., 1999), thus, enhancing individual and organizational learning.

That may be the reason why, although previous studies define OL as a multilevel concept, they do not usually analyze the relationship between learning at each of the three levels and business performance, but their effect as a hold on performance.

Literature considers organizational learning as a basis for gaining a sustainable competitive advantage and a key variable in the enhancing of organizational performance (Dodgson, 1993; Garvin, 1993; Nevis et al., 1995; Brockmand and Morgan, 2003). In this line, some authors suggest that firms that are able to learn stand a better chance of sensing events and trends in the marketplace (Day, 1994; Sinkula, 1994; Tippins and Sohi, 2003). Furthermore, Dickson (1996) argues that learning is pre-eminent over other resources or capabilities, because it enables firms to maintain long-term competitive advantages by continuously improving market information processing activities at a faster rate than rivals do (Day, 1994; Slater and Narver, 1995).

There are also empirical evidence supporting a positive relation between organizational learning capability and firm performance (e.g., Hurley and Hult, 1998; Keskin, 2006; Rhodes et al., 2008; Camps and Luna-Aroca, 2012). The relationship between each of the three OL levels and performance has received little attention in the literature. We have only found two studies in this line (Bontis et al., 2002; Jyothibabu et al., 2010). Both of them provide evidence of the relationship between each learning level and performance which reinforces the idea that OL is associated to performance.

Thus, the first hypothesis of this paper suggests that:

**Hypothesis 1.** Organizational learning is positively associated with firm performance.

## 2.2. Training and organizational learning

Given the importance of organizational learning in relation to firm performance, a number of studies have tried to identify the determinants of the firm’s learning capability (Senge, 1990; McGill et al., 1992; Harvey and Denton, 1999; Alavi and Leidner, 2001). The literature highlights human resources (Huber, 1991; Kim, 1993; Nonaka and Takeuchi, 1995; Denis et al., 2001) and, as a consequence, human resource management (HRM) practices (McGill et al., 1992; Dodgson, 1993; Ulrich et al., 1993; Kamoche and Mueller,

1998; Jaw and Liu, 2003; Camps and Luna-Aroca, 2012), since HR practices “are the primary means by which firms can influence and shape the skills, attitudes and behavior of individuals” (Chen and Huang, 2009). Furthermore, HRM can develop an organizational culture and context that encourage the acquisition and transfer of knowledge within the organization (Jaw and Liu, 2003; Cabrera and Cabrera, 2005; Edvardsson, 2008).

Among the HRM practices, the key role of training for OL is highlighted in some studies (e.g., McGill and Slocum, 1993; Nonaka and Takeuchi, 1995; Jerez Gomez et al., 2004) due to both, its impact on the development of individual learning capabilities, and its role in the creation of a learning-oriented culture.

However, the research examining the relationship between training and OL in deep is still very scarce. We have only found one paper focusing of the relation between training and OL capability (Jerez Gomez et al., 2004). There are other studies which examine the relationship between OL (most of them defining it as a process) and some HRM practices, training being one of them (Cabrera and Cabrera, 2005; Perez Lopez et al., 2006; Chen and Huang, 2009). We have also found papers which include training within a learning-oriented HRM system and examine the effect of such a system on OL capability (Camps and Luna-Aroca, 2012). Finally, recently, some papers focus on the relation between HRM practices, including training, and knowledge transfer (Chiang et al., 2011; Fong et al., 2011).

Thus, more efforts are needed to understand more in-depth the relationship between training and OL.

Based on above-mentioned studies, this paper suggests the organizational learning capability of a firm may be stimulated by the application of a learning-oriented training. A review of the literature suggested that a learning-oriented training would be characterized by the broad application of training, which is planned and long-term oriented, multi-skill oriented and team oriented. Following, we provide the arguments supporting this assumption.

There is a general agreement in the literature about the importance of a broad application of training for OL (McGill and Slocum, 1993; Ulrich et al., 1993; Ahmed et al., 1999; Jaw and Liu, 2003; Jerez Gomez et al., 2004; Cabrera and Cabrera, 2005; Perez Lopez et al., 2006; Chen and Huang, 2009; Fong et al., 2011). The idea is that extensive and continuous training is a key tool, first, to nurture employees’ learning capabilities, both their competencies to learn and their motivation and attitudes to learn (Nonaka and Takeuchi, 1995; Jaw and Liu, 2003; Chen and Huang, 2009); second, to provide a common language and shared vision that facilitate communication among employees and, therefore, the transfer and dissemination of individual knowledge within the firm (Jerez Gomez et al., 2004; Jaw and Liu, 2003; Fong et al., 2011); and, third, to create a learning oriented culture and context (Ahmed et al., 1999; Jaw and Liu, 2003; Jerez Gomez et al., 2004). Based on these assumptions, it is expected that a broad application of training favors the three levels of OL, individual, group and organizational. We have not found any empirical research analyzing the relationship between the broad application of training and each of the three OL levels, but the study by Jerez Gomez et al. (2004) provides evidence that ongoing training enhances organizational learning capability as a hold. Other

researches find that training (define as extensive, among other characteristics) is positively associated to the OL processes (Perez Lopez et al., 2006; Chen and Huang, 2009), to knowledge transfer (Fong et al., 2011) or to the development of positive learning attitudes and a self-renewal climate (Jaw and Liu, 2003).

A second training characteristic which is expected to favor the OL capability of the firm is that training is planned and long-term oriented, since it improves the adaptation and anticipation capacity the environment requires (Nevis et al., 1995). Thus, it is reasonable to think that a planned and long-term oriented training may contribute to the development of employees' learning capabilities (individual OL level) and a learning oriented context (organizational OL level). Some studies have found a positive relation between the OL process and a construct of training which include extensive and on-going training (Perez Lopez et al., 2006; Chen and Huang, 2009). The research of Camps and Luna-Aroca (2012) provides evidence that a learning oriented HRM system is associated to the OL capability of the firm. They include training in such a HRM system, defining training with three scales, being "our training programs anticipate future needs" one of them.

Literature also suggests that organizational learning requires multi-skill training (Leonard-Barton, 1992; Kiernan, 1993; Jerez Gomez et al., 2004; Cabrera and Cabrera, 2005; Camps and Luna-Aroca, 2012) because using multi-skill training, the firm can enhance employees' flexibility and broaden their insights and them with innovative minds and skills (Nonaka and Takeuchi, 1995; Jerez Gomez et al., 2004; Chen and Huang, 2009). In addition, multi-skill training makes the employees more versatile and "more capable of acquiring more varied information from their own experience and from that of other" (Jerez Gomez et al., 2005), which also contribute to knowledge transfer. As a consequence, we expect that multi-skill training favors OL through a positive effect, at least, on the individual and group levels of the OL capability. The papers of Chen and Huang (2009) and Camps and Luna-Aroca (2012) include this training characteristic within their measure of a learning-oriented training.

Finally, since teamwork is very important for OL (Cabrera and Cabrera, 2005; Gagné, 2009; Fong et al., 2011), training should be team-based (Garvin, 1993; Nonaka and Takeuchi, 1995; Ahmed et al., 1999; Jerez Gomez et al., 2004; Cabrera and Cabrera, 2005). Group based is expected to favor, mainly, the OL group level, since, it fosters the constant interaction among the individuals (Garvin, 1993), which favors the interpretation and transfer of knowledge (Garvin, 1993; Ulrich et al., 1993; Jerez Gomez et al., 2004) and also fosters the groups' commitment to learning (Jerez Gomez et al., 2004). The positive effect of group-based training on the OL capability as a hold is supported by the findings of Jerez Gomez et al. (2004).

In summary, we propose the second hypothesis:

**Hypothesis 2.** The adoption of a learning-oriented training is positively associated with organizational learning.

### 2.3. Learning-oriented training and performance

Training can be defined as the systematic acquisition and development of the knowledge, skills, and attitudes

required by employees to adequately perform a task or job or to improve performance in the job environment (Goldstein, 1993).

Training is considered to improve firm performance. The *resource-based view of the firm* and the *knowledge perspective* provide support for this idea. According to these perspectives, the main sources of competitive advantage for the firm are its intangible resources (Barney, 1991). Among these, human resources, in particular human knowledge, skills and attitudes, are highlighted (Kamoche, 1996; Mueller, 1996; Barney and Wrigh, 1998). Although all practices of personnel management are involved in the development of these resources, training is considered the main activity in getting qualified, flexible and well prepared employees (MacDuffie and Kochan, 1995; Bae and Lawler, 2000; Velada and Caetano, 2007), that is to say, the firm's human capital which facilitates the creation of a sustainable competitive advantage and, therefore, improves firm performance (Giovanni and Massimiliano, 2007; Tharenou et al., 2007; Thang and Buyens, 2008).

A number of empirical studies have analyzed the relationship between training and performance. In general, their findings show that training has a positive effect on productivity (Barron and Berger, 1999; Aragon et al., 2003; Faems et al., 2005; Birdi et al., 2008), sales growth (Huselid, 1995; Barrett and O'Connell, 2001), employees' salaries (Bartel, 1994; Lengermann, 1996) and quality (Murray and Raffaele, 1997; Cantarello et al., 2012). However, the evidence of a positive effect of training on financial performance is very weak (Tharenou et al., 2007). Furthermore, some studies find that training is negatively related to some measures of financial performance (Birley and Westhead, 1990; Wiley, 1991; Wright et al., 1999).

However, literature still considers that training and performance are positively related. Thus, various reasons have been put forward to explain why sometimes empirical evidence does not support this assumption. Before, we have mentioned one of them, that training does not have a direct effect on performance, but an indirect effect by improving employee performance and other organizational outcomes (Ahmad and Schroeder, 2003; Gelade and Ivery, 2003; Faems et al., 2005).

As it was previously mentioned, this paper focused on the mediating role of OL in the relationship between training and performance. In this line, some previous researches suggest that the positive effect of training on performance is due to the fact that the former may foster organizational learning (Leonard-Barton, 1992; Garvin, 1993; Ulrich et al., 1993; Nonaka and Takeuchi, 1995; Jerez Gomez et al., 2004) and, as a consequence, it may improve organizational knowledge (Alavi and Leidner, 2001; Bollinger and Smith, 2001), which is considered to be one of the main sources of competitive advantage for a firm (Kogut and Zander, 1992; Grant, 1996). Based on this literature, this paper proposed that the adoption of a learning-oriented training foster organizational performance mainly through its positive effect on the OL capability of the firm.

Furthermore, the findings of some studies focusing on the relationship between some of the characteristics of a learning-oriented training and performance suggest that those characteristics may also have a direct effect on performance.



For instance, most empirical studies on the relationship between training and performance show that organizations can improve by providing extensive training and that investment in ongoing training has a positive impact on organizational outcomes (Huselid, 1995; MacDuffie, 1995; Delaney and Huselid, 1996).

The literature also suggests that training should be planned and long-term oriented for having a positive effect on performance. Storey (2004) names this type of training "formal", in contrast with "informal" training that is not structured. The assumption here is that firms should develop training plans, taking into account the organizational goals to be achieved and the resources available. Most empirical studies on this issue find that planned and long-term oriented training has a positive effect on performance, mainly when the content of work provides for enrichment and for long-term results (Valle et al., 2000; Aragon et al., 2003; Birdi et al., 2008; Aguinis and Kraiger, 2009).

According to the literature, general or multi-skill training has also a positive impact on performance. Becker (1975) defines general training as the type of training that raises productivity by equal amounts in the firm where it is provided and in other firms. Some studies find that multi-skill training has a favorable effect on performance and higher than the impact of specific training. For instance, Arthur (1994) showed that general training reduces turnover, and Barrett and O'Connell (2001) concluded that multi-skill training promotes productivity growth more strongly than specific training.

Finally, from the early 1980s to the present, the use of teams in organizations has greatly increased, and firms continue to structure work around teams rather than individual jobs. Traditionally, practitioners assumed that individuals need to be trained and increase their competences in their respective individual tasks, before being placed in a team environment. However, some recent studies show that training recall, transfer, and post-training team performance actually improve when training occurs within a team context (Hollenbeck et al., 2004). The advantages of team-oriented training relative to individual training primarily result from team interactions and team leader support (Marks et al., 2000; Smith-Jentsch et al., 2001).

Summarizing previous arguments, we formulate the following hypothesis:

**Hypothesis 3.** The adoption of a learning-oriented training is positively associated with firm performance.

### 3. Methodology

#### 3.1. Data collection and sample

Data for this study come from a more extensive research, financed by the European Union. Our sample was drawn from SABI (System of Iberian Financial Statement Analysis<sup>1</sup>). The database includes Spanish firms with more than fifteen employees. This database contains financial information for 520,000 companies (480,000 from Spain and 40,000 from

Portugal), and includes public and private, Spanish and Portuguese companies, with up to 10 years of data and it is updated daily. It was designed to reach across industries (excluding the agricultural sector). A total of 1600 companies constituted the population.

Data were collected by means of a personal interview with the CEO of the company, using a structured questionnaire. In order to collect high-quality data, the interviewers were trained, to familiarize them with the variety of situations likely to be encountered, as well as the concepts, definitions, and procedures involved. 836 usable questionnaires were obtained, yielding a response rate of 52.25 per cent. The unit of analysis for this study was the company, on the assumption that aspects relating to training, organizational learning, and performance affect the entire organization.

We compared respondent and non-respondent companies in terms of industry, size (number of employees and net value turnover) and profits (profit per employee and profit before tax). These comparisons did not reveal any significant differences, suggesting no response bias.

#### 3.2. Measures

##### 3.2.1. Training practices

In order to define the training policy we have reviewed literature that focuses on organizational learning and performance. This review shows that there is no consensus on how to measure the characteristics of the training. Taking into account the training measures used by Valle et al. (2000) and Chen and Huang (2009), four practices are proposed: broad application of training, planned and long-term oriented training, team-oriented training and multi-skills oriented training. For measuring these practices we have used four five-point Likert-type scales. However, understanding the underlying essence of the construct, whether it is reflective (i.e., changes in the underlying construct cause changes in the indicators) or formative (i.e., indicators impact or cause the underlying construct), is an essential first step in modeling its structure (MacKenzie et al., 2005). Therefore, the choice depends primarily on whether the items are viewed as indicators or causes of the factor (Chin, 1998). We adopt the formative way for measuring training. In this way, an increase in the level of each training practice (i.e., long-term orientation) does not imply an increase in the level of the other practices (i.e., team orientation) (Rauch et al., 2005). Thus, dimensions are not necessarily correlated, and consequently, traditional reliability and validity assessment have been argued as inappropriate and illogical for a formative factor, with reference to its items (Bollen, 1989).

##### 3.2.2. Organizational learning

The literature has used different measures of OL depending on the approach adopted. As above-mentioned, this paper considers OL as an organizational capability that can be described at three levels: individual, group and organizational. Thus, we suggest OL as a multilevel variable which should be measured as a second-order construct. Most of previous studies also measure OL capability as a second-order construct (Jerez Gomez et al., 2004, 2005; Chiva

<sup>1</sup> In Spanish: Sistema de Análisis de Balances Ibéricos.

**Table 1** Constructs measurements summary: confirmatory factor analysis and scale reliability.

Item description	Std. loading	Reliability (SCR <sup>a</sup> , AVE <sup>b</sup> )
<i>Learning-oriented training (formative construct)</i>		
• Broad application of training		
• Planned and long term orientation training		
• Team-oriented training		
• Multi-skills training		
(Scale: 1 = strongly disagree; 5 = strongly agree)		
<i>Individual learning level</i>		
• Individuals are able to break out of traditional mind-sets to see things in new and different ways	0.794	
• Individuals feel a sense of pride in their work	0.778	
• Individuals have a clear sense of direction in their work	0.733	
• Individuals generate many new insights	0.792	SCR = 0.90
• Individuals are aware of the critical issues that affect their work	0.773	AVE = 0.59
• Individuals feel confident in their work	0.732	
• Individuals feel a sense of accomplishment in what they do <sup>c</sup>		
(Scale: 1 = strongly disagree; 5 = strongly agree)		
<i>Group learning level</i>		
• We have effective conflict resolution when working in groups	0.763	
• Different points of view are encouraged in group work	0.838	SCR = 0.92
• Groups have the right people involved in addressing the issues	0.836	AVE = 0.66
• We share our success within the group	0.834	
• In meetings, we seek to understand everyone's point of view	0.776	
• Groups in the organization are adaptable	0.821	
• Groups are prepared to rethink decisions when presented with new information <sup>c</sup>		
(Scale: 1 = strongly disagree; 5 = strongly agree)		
<i>Organizational learning level</i>		
• We have a strategy that positions us well for the future	0.702	
• We have the necessary systems to implement our strategy	0.808	
• The organization's culture could be characterized as innovative	0.718	SCR = 0.91
• The organizational structure allows us to work effectively	0.860	AVE = 0.63
• We have a realistic yet challenging vision for the organization	0.790	
• We have an organizational culture characterized by a high degree of trust	0.852	
• Our operational procedures allow us to work efficiently <sup>c</sup>		
(Scale: 1 = strongly disagree; 5 = strongly agree)		
<i>Performance</i>		
• Return on assets	0.965	
• Profit per employee	0.924	SCR = 0.94
• Profit margin	0.861	AVE = 0.79
• Return on equity	0.792	
(Scale: in the three previously years: 1 = low; 5 = high)		

Fit statistics for measurement model of 22 indicators for 4 constructs:  $\chi^2_{(265)} = 647.294$ ; GFI = 0.903; RMSEA = 0.055; CFI = 0.952; IFI = 0.952; BNNFI = 0.945; RMR = 0.041.

<sup>a</sup> Scale composite reliability ( $\rho_c = (\sum \lambda_i)^2 \text{var}(\xi) / [(\sum \lambda_i)^2 \text{var}(\xi) + \sum \theta_{ii}]$ ; Bagozzi and Yi (1998)).

<sup>b</sup> Average variance extracted ( $\rho_c = (\sum \lambda_i)^2 \text{var}(\xi) / [(\sum \lambda_i)^2 \text{var}(\xi) + \sum \theta_{ii}]$ ; Fornell and Larcker (1981)).

<sup>c</sup> Item deleted after a confirmatory factor analysis.

et al., 2007; Di Milia and Birdi, 2010). The scales used in this study (see Table 1) were extracted from Bontis (1999) and Bontis et al. (2002). First, because Bontis' research is one of few researches that offer measures for these three OL levels. Furthermore, we have found a recent paper adopting this approach and uses Bontis' scales too (Jyothibabu et al., 2010). Second, we found these scales suitable for this research since they are consistent with the concepts of individual learning, group learning and organizational

learning defined in the theoretical framework of this paper.

### 3.2.3. Performance

To evaluate the results of organizational learning and human resource management, previous studies have used different measures. Many scholars use self-explanatory measures of performance, such as market share, profitability, productivity and customer satisfaction, since subjective and objective

measures of performance are highly correlated (Dess and Robinson, 1984). However, in this study we have incorporated the following four objective measures directly from SABI database: return on assets, profit per employee, profit margin and return on equity. This also allows correlating measures from different sources what avoid some response bias. These four measures were recoded to 1–5.

### 3.2.4. Control variables

Two control variables were included in the analysis from the SABI database, those which have been traditionally considered in the literature as explanatory of learning and performance: firm's size that is measures with the number of employees (Kimberly and Evanisko, 1981; Damanpour and Evan, 1984) and age from the creation of the company (Aiken and Hage, 1971; Pierce and Delbecq, 1977; Hitt et al., 1997; Sørensen and Stuart, 2000). Also, the variables were rescaled as the rest of the measures used in this paper.

### 3.3. Confirmatory factor analysis

Following the two-stage model-building process for applying structural equation modeling (SEM) (Hair et al., 1998; Hoyle and Panter, 1995; Jöreskog and Sörbom, 1996), the data analysis is conducted in two steps: first, using confirmatory factor analysis, and second, analyzing the hypotheses with structural equation models.

Confirmatory factor analysis (CFA) seeks to determine if the number of factors and the loadings of measured (indicator) variables on them conform to what is expected on the basis of pre-established theory. CFA assessed the measurement quality of every construct, as well as of the whole model. Thus, to assess the unidimensionality of the measures, individual factor analyses for learning and performance constructs have been applied obtaining a good fit of goodness (Anderson and Gerbing, 1988). Also, a confirmatory factor analysis of the four constructs was conducted (Table 1). The measurement model provides a reasonable fit to the data ( $\chi^2 = 366.726$ ,  $df = 146$ ; GFI = 0.931; RMSEA = 0.053; BBNFI = 0.964; CFI = 0.969; IFI = 0.969). The traditionally reported fit indexes are within the acceptable range.

The reliability of those measures was calculated with Bagozzi and Yi's (1998) composite reliability index and with Fornell and Lacker's (1981) average variance extracted

index. For all the measures both indices are higher than the evaluation criteria of 0.6 for composite reliability and 0.5 for average variance extracted (Bagozzi and Yi, 1998). Furthermore, discriminant validity is indicated, as the average for every construct is higher than the square estimated correlation parameter between each two constructs (Fornell and Larcker, 1981).

Following Bagozzi and Baumgartner (1994), we examined modification indices and residual analyses for locating sources of misspecification in a measurement model. The value of modification indices is that they provide an estimate of the expected decrease in overall chi-square if the fixed parameters under consideration were estimated freely. Large modification indexes indicate that factor cross-loadings and error covariance are present (i.e., a loading on more than one factor) (Anderson and Gerbing, 1988; Byrne, 2001). After the process of purging the scales, we finally used four items to measure performance ( $\rho_c^{SCR} = 0.936$ ,  $\rho_c^{AVE} = 0.787$ ). In the case of organizational learning, the confirmatory factor analysis suggests the use of five items to measure individual level ( $\rho_c^{SCR} = 0.873$ ,  $\rho_c^{AVE} = 0.579$ ), five items to measure group level ( $\rho_c^{SCR} = 0.912$ ,  $\rho_c^{AVE} = 0.674$ ) and another five to measure organizational level ( $\rho_c^{SCR} = 0.904$ ,  $\rho_c^{AVE} = 0.653$ ). However, organizational learning has been measured as a unique construct. A second-order factor analysis demonstrated that the three dimensions could be modeled by a higher-order construct. The results suggest a good fit of the second-order specification ( $\chi^2 = 272.828$ ,  $df = 87$ ; GFI = 0.947; RMSEA = 0.057; BBNFI = 0.964; CFI = 0.970; IFI = 0.970; RMR = 0.023; standardized RMR = 0.034). All, GFI, CFI, BBNFI and IFI, exceed the recommended 0.90 threshold level (Hoyle and Panter, 1995). The RMSEA, the root mean square residual and their standardized value are considered acceptable by the standards normally accepted in the literature. Table 2 provides an overview of constructs' means, standard deviations, and correlations among the variables measured to test our hypotheses.

## 4. Results

Structural equations modeling (SEM) methodology was employed to test the hypotheses. The proposed structural model is shown in Fig. 1. Conventional maximum likelihood estimation techniques were used to test the model

**Table 2** Construct correlation matrix.

Construct	Mean	Standard deviation	Correlation matrix						
			1	2	3	4	5	6	7
1. Learning-oriented training	3.064	0.949	1						
2. Individual level	3.596	0.652	0.221***	1					
3. Group level	3.492	0.702	0.268***	0.665***	1				
4. Organizational level	3.826	0.672	0.295***	0.533***	0.580***	1			
5. Performance	2.989	1.297	0.078**	0.148**	0.104**	0.105***	1		
7. Age	2.986	1.357	0.040	0.024	0.003	0.032	−0.010	1	
8. Size	2.959	1.404	0.091**	−0.047	0.005	0.084**	−0.024	0.142***	1

\*\*  $P < 0.05$ .

\*\*\*  $P < 0.01$ .

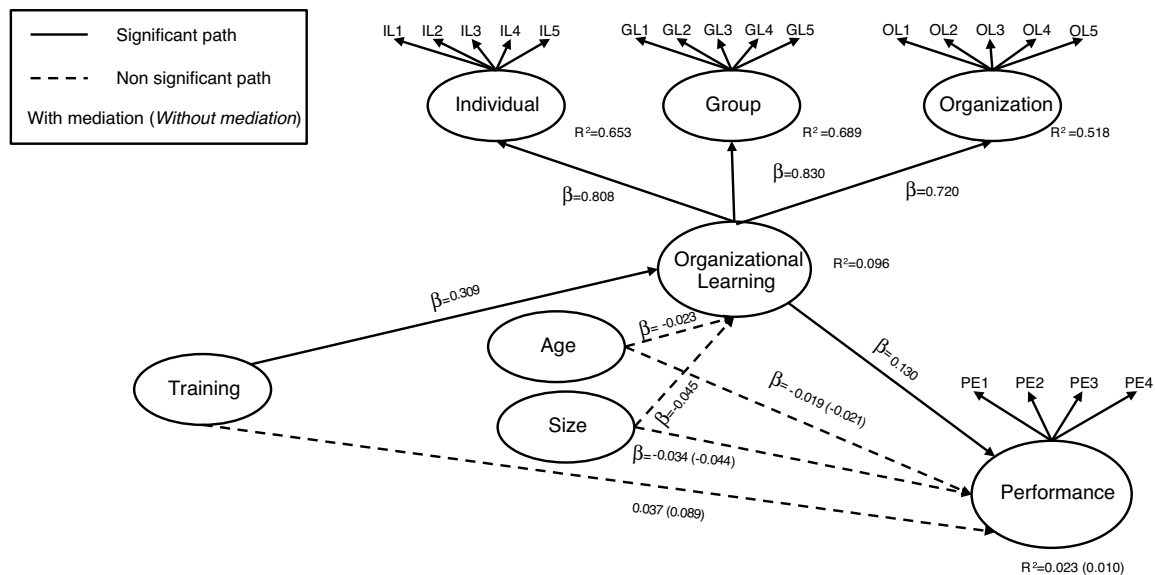


Fig. 1 A model of the relationship between training, organizational learning and performance.

(Jöreskog and Sörbom, 1996). The fit of the model is satisfactory ( $\chi^2 = 456.033$ ,  $df = 199$ ;  $GFI = 0.921$ ;  $RMSEA = 0.051$ ;  $CFI = 0.962$ ;  $IFI = 0.962$ ;  $BNNFI = 0.955$ ), thereby suggesting that the nomological network of relationships fits our data. This is another indicator to support the validity of the scales (Churchill, 1979).

In term of our hypotheses (Table 3), the findings for  $H_1$  (organizational learning  $\rightarrow$  performance;  $\beta = 0.130$ ,  $p < 0.01$ ) show that OL is positively associated to performance. This suggests that organizational learning is a fundamental organizational capability for the firm and provide evidence that supports  $H_1$ .

Table 3 Construct structural model.

Linkages in the model	Hypotheses	Std. estimation	t-Value
<i>Main paths</i>			
Organizational learning $\rightarrow$ performance	$H_1$	0.130	2.363***
Learning-oriented training $\rightarrow$ organizational learning	$H_2$	0.309	5.956***
Learning-oriented training $\rightarrow$ performance	$H_3$	0.037	0.757
<i>Second-order construct</i>			
Organizational learning $\rightarrow$ individual level		0.808	— <sup>a</sup>
Organizational learning $\rightarrow$ group level		0.830	11.114***
Organizational learning $\rightarrow$ organizational level		0.720	11.006***
<i>Control variables</i>			
Age $\rightarrow$ organizational learning		−0.023	0.460
Size $\rightarrow$ organizational learning		−0.045	0.906
Age $\rightarrow$ performance		−0.019	0.408
Size $\rightarrow$ performance		−0.034	0.744
<i>Indirect effects</i>			
Learning-oriented training $\rightarrow$ individual level		0.249	5.956***
Learning-oriented training $\rightarrow$ group level		0.256	6.000***
Learning-oriented training $\rightarrow$ organizational level		0.222	5.889***
Learning-oriented training $\rightarrow$ performance		0.040	2.230**

Fit statistics for measurement model of 22 indicators:  $\chi^2_{(199)} = 456.033$ ;  $GFI = 0.921$ ;  $RMSEA = 0.051$ ;  $CFI = 0.962$ ;  $IFI = 0.962$ ;  $BNNFI = 0.955$ ;  $RMR = 0.041$ ;  $SRMR = 0.041$ .

<sup>a</sup> Fixed parameter.

\*  $P < 0.1$ .

\*\*  $P < 0.05$ .

\*\*\*  $P < 0.01$ .



**Table 4** Structural model without mediation.

Linkages in the model	Std. estimation	t-Value
<i>Main path</i>		
Learning-oriented training → performance	0.089	2.037**
<i>Control variables</i>		
Age → performance	−0.021	0.469
Size → performance	−0.044	1.005

Fit statistics for measurement model of 7 indicators:  $\chi^2_{(11)} = 61.816$ ; GFI = 0.969; RMSEA = 0.082; CFI = 0.976; IFI = 0.976; BNNFI = 0.954; RMR = 0.050; SRMR = 0.027.

\*  $P < 0.1$ .

\*\*  $P < 0.05$ .

\*\*\*  $P < 0.01$ .

The findings also support  $H_2$ . As we expected, a learning-oriented training has a clear effect on OL (learning-oriented training → organizational learning;  $\beta = 0.309$ ,  $p < 0.01$ ). Moreover, we also found a positive and indirect effect of the variable learning-oriented training on each of the three levels of OL (individual:  $\kappa = 0.249$ ; group:  $\kappa = 0.256$ ; organizational:  $\kappa = 0.222$ ).

In relation to  $H_3$ , the findings do not show a direct association between the adoption of a learning-oriented training and performance (learning-oriented training → performance;  $\beta = 0.037$ ,  $p > 0.1$ ). However, the findings suggest an indirect effect of a learning-oriented training on performance ( $\kappa = 0.040$ ,  $p < 0.05$ ).

In order to test further that learning-oriented training has an indirect effect on performance, we compared the proposed model with an alternative model that does not include organizational learning (Anderson and Gerbing, 1988). In this alternative model, a direct path from learning-oriented training to performance (Table 4) was specified in order to apply Baron and Kenny's general idea (1986) about mediating variables which has been adapted to causal models. The results of the mediation link support our hypothesis. Firstly, the mediation model explains more variance on performance ( $R^2 = 0.023$ ) than the direct effect model ( $R^2 = 0.010$ ). Secondly, positive relationships exist between learning-oriented training and OL, and between OL and performance. Thirdly, the significant relationship between learning-oriented training and performance in the direct effect model ( $\beta = 0.089$ ,  $p < 0.05$ ) is not significant in the model with mediation ( $\beta = 0.037$ ,  $p > 0.1$ ). Taking into account all these results as a whole, we can conclude that the effect of the adoption of a learning-oriented training on performance is completely mediated by OL (Baron and Kenny, 1986).

## 5. Discussion

This paper has focused on the relationship between training, organizational learning and performance. Despite the presumed positive effect of training on performance, empirical studies do not always provide evidence to support it. This paper explores whether this lack of empirical support is due to the fact that training does not have a direct effect on performance, but has an indirect effect, improving, among other variables, organizational learning.

A review of the literature on the relationship between, on the one hand, organizational learning and performance, and on the other hand, training and organizational learning, seems to support the idea that organizational learning may mediate the relationship between training and performance. However, no empirical research had examined this suggestion. The purpose of this paper was to fill this gap in the literature and to analyze the relationship between training, in particular a learning-oriented training, and performance and the mediating role of organizational learning in that relationship.

In terms of the relationship between organizational learning and performance, our results are also consistent with previous theoretical and empirical research (Hurley and Hult, 1998; Bontis et al., 2002; Keskin, 2006; Rhodes et al., 2008; Camps and Luna-Aroca, 2012), and show a positive relation between them. Thus, our findings provide more evidence of the importance of organizational learning for firm's success.

Our findings also provide evidence that there is a positive relation between a learning-oriented training and organizational learning. This learning-oriented training includes providing employees with an extensive training, planned and long-term oriented training, multi-skill and team-oriented. This result supports the theoretical literature (Leonard-Barton, 1992; McGill et al., 1992; Garvin, 1993; McGill and Slocum, 1993; Ulrich et al., 1993; Nonaka and Takeuchi, 1995) and is consistent with the few empirical studies on this issue (Jerez Gomez et al., 2004; Perez Lopez et al., 2006; Chen and Huang, 2009) and shows that training is a key tool in enhancing the organizational capability of the firms.

Finally, we did not find evidence for a direct effect of a learning-oriented training on performance. This result is not consistent with the general assumption in the literature but, as it was mentioned before, other empirical research has found similar results (Black and Lynch, 1996; Krueger and Rouse, 1998; Schonewille, 2001). Furthermore, according to previous literature, one likely explanation for such a contradictory result is that training does not have a direct effect on performance but that the relationship between these two variables is mediated by others. However, there are few papers examining this assumption. This paper does it, focusing on the OL capability as a mediating variable between training and performance.

The analysis of that likely mediating effect show that the adoption of a learning-oriented training has a significant indirect effect on performance, through its impact of training on organizational learning which, in turn, leads to higher performance. In other words, findings suggest that training is a key tool to increase the firm's organizational learning capability at individual, group and organizational level and that, through this effect, training may affect performance.

In sum, the main contributions of this paper are, first, that it goes into the "black-box" between training and performance and examines whether organizational learning mediates the relationship between the former variables. The literature suggests that the link between training and performance may be mediated by different variables. However, the empirical research on this issue is very scarce and, at present, there are not studies examining

the mediating role of OL. Second, this study provides empirical evidence supporting that OL mediating effect. This finding allows explaining, at least partially, the contradictory results that some researches have obtained regarding the relationship between training and performance.

This study has also implications for practitioners. On the one hand, like previous research, our data show that in order to achieve better performance, companies should foster their organizational learning capability. The reason is that the organizational learning capability and its output, organizational knowledge, enable companies to anticipate and understand better the customer needs and the competitive situation, to process this information faster and to develop new products, processes or systems which allow them to achieve a competitive advantage.

On the other hand, our data indicate that a key tool to develop the organizational learning capability, at its three levels of analysis – individual, group and organizational – is training. Thus, this research shows that investment training pays off. Companies should be conscious that training efforts will not lead to better performance directly but training should be oriented to the organizational learning capability in order to do it. In other words, firms should adopt a learning-oriented training.

Furthermore, our findings suggest how training should be designed in order to contribute to organizational learning. In this line, we define a learning-oriented training as that which is extensive, planned and future-oriented, multi-skill and team-oriented. The reason is that this training design enhances individual learning capabilities (competencies and motivation to acquire knowledge), group learning capabilities (efficiency for working in groups and motivation for sharing knowledge), and organizational learning capabilities (culture, strategy and systems favoring organizational learning).

Despite the contributions of this paper, its results should not be interpreted without recognizing the potential limitations of this study. The more important one is its cross-sectional design, which may constrain both the observation of multiple long-term effects of each variable and the elucidation of causal relationships between the variables. This limitation could be avoided by employing a longitudinal study design.

Other recommendations for future research on the relationship between HRM and OL emerge from the present study. Since the premise training affects organizational learning is based on the idea that training enhances employees' competencies and fosters the development of a learning-oriented culture, we suggest including these variables in the model as mediators of the relationship between training and organizational learning. Finally, another future line of research is that proposed by Jerez Gomez et al. (2004), namely the examination of the effect of training on performance, not as an isolated practice but taking into account other HRM practices.

## Acknowledgement

The authors thank the Spanish Ministry of Science and Innovation for its Grant ECO2009-12825.

## References

- Aguinis, H., Kraiger, K., 2009. Benefits of training and development for individuals and teams, organizations, and society. *Annual Review of Psychology* 60, 451–474.
- Ahmad, S., Schroeder, R.G., 2003. The impact of human resource management practices on operational performance. *Journal of Operational Management* 21, 19–43.
- Ahmed, P.K., Loh, A.Y.E., Zairi, M., 1999. Culture for continuous improvement and learning. *Total Quality Management* 10, 426–434.
- Aiken, M., Hage, J., 1971. The organic organization and innovation. *Sociology* 5, 63–82.
- Alavi, M., Leidner, D.E., 2001. Review: knowledge management and knowledge management systems: conceptual foundations and research issues. *MIS Quarterly* 25, 107–136.
- Anderson, J.C., Gerbing, D.W., 1988. Structural equation modelling in practice: a review and recommended two-step approach. *Psychological Bulletin* 103, 411–423.
- Aragon, A., Barba, M.I., Sanz, R., 2003. Effects of training on business results. *International Journal of Human Resource Management* 14, 956–980.
- Arthur, J.B., 1994. Effects of human resource systems on manufacturing performance and turnover. *Academy of Management Journal* 37, 670–687.
- Attewell, P., 1992. Technology diffusion and organizational learning: the case of business computing. *Organization Science* 3, 1–19.
- Bae, J., Lawler, J.J., 2000. Organizational and HRM strategies in Korea: impact on firm performance in an emerging economy. *Academy of Management Journal* 43, 502–519.
- Bagozzi, R.P., Baumgartner, H., 1994. The evaluation of structural equation models and hypothesis testing. In: Bagozzi, Richard (Ed.), *Principles of Marketing Research*. Cambridge, MA, Blackwell, pp. 386–422.
- Bagozzi, R.P., Yi, Y., 1998. On the evaluation of structural equation model. *Journal of the Academy of Marketing Science* 16, 74–94.
- Ballesteros, J.L., De Saá, P., Domínguez, C., 2012. The role of organizational culture and HRM on training success: evidence from the Canarian restaurant industry. *International Journal of Human Resource Management* 23, 3225–3242.
- Bapuji, H., Crossan, M.M., 2004. From questions to answers: reviewing organizational learning research. *Management Learning* 35, 397–417.
- Barney, J.B., Wrigh, P.M., 1998. On becoming a strategic partner: the role of human resources in gaining competitive advantage. *Human Resource Management* 37, 31–46.
- Barney, J.B., 1991. Firm resources and sustained competitive advantage. *Journal of Management* 17, 99–120.
- Baron, R.M., Kenny, D.A., 1986. The moderator–mediator variable distinction in social psychological research: conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology* 51, 1173–1182.
- Barrett, A., O'Connell, P.J., 2001. Does training generally work? The returns to in-company training. *Industrial and Labor Relations Review* 54, 647.
- Barron, J.M., Berger, M.C., 1999. Do workers pay for on-the-job training? *Journal of Human Resources* 34, 235–253.
- Bartel, A.P., 1994. Productivity gains from the implementation of employee training programs. *Industrial Relations* 33, 411–425.
- Becker, G.S., 1975. *El capital humano*. Alianza, Madrid.
- Bell, S.J., Mengüç, B., Widing, R.E., 2010. Salesperson learning, organizational learning, and retail store performance. *Journal of the Academy Marketing Science* 38, 187–201.
- Birdi, K., Clegg, C., Patterson, M., Robinson, A., Stride, C.B., Wall, T.D., 2008. The impact of human resource and operational management practices on company productivity: a longitudinal study. *Personnel Psychology* 61, 467–501.

- Birley, S., Westhead, P., 1990. Growth and performance contrast between 'types' of small firms. *Strategic Management Journal* 11, 535–557.
- Black, S., Lynch, L., 1996. Human capital investments and productivity. *American Economic Review* 86, 263–267.
- Bollen, K.A., 1989. *Structural Equations with Latent Variables*. Wiley, New York.
- Bollinger, A.S., Smith, R.D., 2001. Managing organizational knowledge as a strategic asset. *Journal of Knowledge Management* 5, 8–18.
- Bontis, N., 1999. Managing organizational knowledge by diagnosing intellectual capital: framing and advancing the state of the field. *International Journal of Technology Management* 18, 433–462.
- Bontis, N., Crossan, M.M., Hulland, J., 2002. Managing an organizational learning system by aligning stocks and flows. *Journal of Management Studies* 39, 437–469.
- Brockmand, B., Morgan, F., 2003. The role of existing knowledge in new product innovativeness and performance. *Decision Sciences* 32, 385–419.
- Byrne, B.M., 2001. *Structural Equation Modelling with AMOS: Basic Concepts, Applications, and Programming*. Routledge Taylor & Francis Group, New York.
- Cabrera, E., Cabrera, A., 2005. Fostering knowledge sharing through people management practices. *International Journal of Human Resource Management* 16, 720–735.
- Camps, J., Luna-Aroca, R., 2012. A matter of learning: how human resources affect organizational performance. *British Journal of Management* 23, 1–21.
- Cantarello, S., Filippini, R., Nosella, A., 2012. Linking human resource management practices and customer satisfaction on product quality. *International Journal of Human Resource Management* 23, 3906–3924.
- Chen, C.J., Huang, J.W., 2009. Strategic human resource practices and innovation performance – the mediating role of knowledge management capacity. *Journal of Business Research* 62, 104–114.
- Chiang, H.H., Hang, T.S., Chuang, J.S., 2011. The relationship between high-commitment HRM and knowledge-sharing behaviour and its mediators. *International Journal of Manpower* 33, 604–622.
- Chin, W.W., 1998. In: Marcoulides, G.A. (Ed.), *The Partial Least Squares Approach to Structural Equation Modeling*. Lawrence Erlbaum Associate, Mahwah, NJ.
- Chiva, R., Alegre, J., Lapiedra, R., 2007. Measuring organisational learning capability among the workforce. *International Journal of Manpower* 28, 224–242.
- Churchill, J.L.C., 1979. A paradigm for developing better measures of marketing construct. *Journal of Marketing Research* 16, 64–73.
- Collins, C.J., Clark, K.D., 2003. Strategic human resource practices, top management team social networks, and firm performance: the role of human resource practices in creating organizational competitive advantage. *Academy of Management Journal* 46, 740–751.
- Crossan, M.M., Kane, H.W., White, R.E., 1999. An organizational learning framework: from intuition to institution. *Academy of Management Review* 24, 522–537.
- Damanpour, F., Evan, W., 1984. Organizational innovation and performance: the problem of organizational lag. *Administrative Science Quarterly* 29, 392–409.
- Day, G.S., 1994. The capabilities of the market-driven organizations. *Journal of Marketing* 58, 37–52.
- Delaney, J., Huselid, M., 1996. The impact of human resources management practices on perceptions of organizational performance. *Academy of Management Journal* 39, 949–969.
- Denis, J., Lamothe, L., Langley, A., 2001. The dynamics of collective leadership and strategic change in pluralistic organizations. *Academy of Management Journal* 44, 809–837.
- Dess, G.G., Robinson, R.B., 1984. Measuring organizational performance in the absence of objective measures: the case of the privately-held firm and conglomerate business unit. *Strategic Management Journal* 5, 265–273.
- Di Milla, L., Birdi, K., 2010. The relationship between multiple levels of learning practices and objective and subjective organizational financial performance. *Journal of Organizational Behavior* 31, 481–498.
- Dickson, P.R., 1996. The static and dynamic mechanics of competition: a comment on Hunt and Morgan's comparative advantage theory. *Journal of Marketing* 60, 102–106.
- Dodgson, M., 1993. Organizational learning: a review of some literatures. *Organization Studies* 14, 375–394.
- Edvardsson, I.R., 2008. HRM and knowledge management. *Employee Relations* 30, 553–561.
- Faems, D., Sels, L., DeWinne, S., Maes, J., 2005. The effect of individual HR domains on financial performance. *International Journal of Human Resource Management* 16, 676–700.
- Flores, L.G., Zheng, W., Rau, D., Thomas, C.H., 2012. Organizational learning: subprocess identification, construct validation, and an empirical test of cultural antecedents. *Journal of Management* 38, 640–667.
- Fong, C.Y., Ooi, K.B., Tan, B.I., Lee, V.H., 2011. HRM practices and knowledge sharing: and empirical study. *International Journal of Manpower* 32, 701–723.
- Fornell, C., Larcker, D.F., 1981. Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research* XXVII, 39–50.
- Gagné, M., 2009. A model of knowledge-sharing motivation. *Human Resource Management* 48, 571–589.
- Garvin, D.A., 1993. Building a learning organization. *Harvard Business Review* 71, 78–91.
- Gelade, G.A., Ivery, M., 2003. The impact of human resource management and work climate on organizational performance. *Personnel Psychology* 56, 383–404.
- Giovanni, G., Massimiliano, M., 2007. Training and organisational innovations in a local industrial system: empirical evidence from Emilia-Romagna1. *Human Resource Management Journal* 17, 283–306.
- Goldstein, I.L., 1993. *Training in Organizations*. Brooks/Cole Publishing Company, California.
- Grant, R.M., 1996. Toward a knowledge-based theory of the firm. *Strategic Management Journal* 17, 109–122.
- Guest, D.E., 2001. Human resource management: when research confronts theory. *International Journal of Human Resource Management* 12, 1092–1106.
- Hair, J.F., Anderson, R.L., Tatham, W.C., 1998. *Multivariate Data Analysis with Reading*. Prentice-Hall, Upper Saddle River, NJ.
- Harvey, C., Denton, J., 1999. To come the age: the antecedents of organizational learning. *Journal of Management Studies* 36, 897–918.
- Hitt, M.A., Hoskisson, R.E., Kim, H., 1997. International diversification: effects innovation and firm performance in product-diversified firms. *Academy of Management Journal* 40, 767–798.
- Hollenbeck, J.R., DeRue, D.S., Guzzo, R., 2004. Bridging the gap between I/O research and HR practices: improving team composition, team training, and team task design. *Human Resource Management* 43, 353–366.
- Hoyle, R.H., Panter, A.T., 1995. Writing about structural equation modelling. In: Hoyle, R.H. (Ed.), *Structural Equation Modelling*. Sage, Thousand Oaks, pp. 158–176.
- Huber, G.P., 1991. Organizational learning the contributing processes and the literatures. *Organization Science* 2, 88–115.
- Hurley, R.E., Hult, G.T.M., 1998. Innovation, market orientation and organizational learning: an integration and empirical examination. *Journal of Marketing* 62, 42–54.

- Huselid, M.A., 1995. The impact of human resource management practices on turnover, productivity and corporate financial performance. *Academy of Management Journal* 38, 635–672.
- Jaw, B.S., Liu, W., 2003. Promoting organizational learning and self-renewal in Taiwanese companies: the role of HRM. *Human Resource Management* 42, 223–241.
- Jerez Gomez, P., Céspedes Lorente, J.J., Valle Cabrera, R., 2004. Training practices and organisational learning capability. *Journal of European Industrial Training* 28, 234–256.
- Jerez Gomez, P., Céspedes Lorente, J.J., Valle Cabrera, R., 2005. Organizational learning capability: a proposal of measurement. *Journal of Business Research* 58, 715–725.
- Jiménez Jiménez, D., Sanz Valle, R., 2006. Innovación, aprendizaje organizativo and resultados empresariales. Un estudio empírico. *Cuadernos de Economía and Dirección de la Empresa* 29, 31–56.
- Jöreskog, K.G., Sörbom, D., 1996. LISREL 8 User's Reference Guide. Scientific Software International, Chicago, IL.
- Jyothibabu, C., Farooq, A., Pradhan, B.B., 2010. An integrated scale for measuring and organizational learning system. *Learning Organization* 27, 303–327.
- Kamoche, K., Mueller, F., 1998. Human resource management and the appropriation-learning perspective. *Human Relations* 51, 1033–1060.
- Kamoche, K., 1996. Strategic human resource management within a resource-capability view of the firm. *Journal of Management Studies* 33, 213–233.
- Keskin, H., 2006. Market orientation, learning orientation, and innovation capabilities in SMEs. *European Journal of Innovation Management* 9, 396–417.
- Kiernan, M., 1993. The new strategic architecture: learning to compete in the twenty-first century. *Academy of Management Executive* 8, 7–21.
- Kiessling, T.S., Richey, R.G., Meng, J., Dabic, M., 2009. Exploring knowledge management to organizational performance outcome in a transitional economy. *Journal of World Business* 44, 421–433.
- Kim, D.H., 1993. The link between individual and organizational learning. *Sloan Management Review* 33, 37–50.
- Kimberly, J.R., Evanisko, M.J., 1981. Organizational innovation: the influence of individual, organizational, and contextual factors on hospital adoption of technological and administrative innovations. *Academy of Management Journal* 24, 689–713.
- Kogut, B., Zander, U., 1992. Knowledge of the firm, combinative capabilities and the replication of technology. *Organization Science* 3, 383–397.
- Kraiger, K., 2003. Perspectives on training and development. In: Borman, W.C., Ilgen, D.R., Klimoski, R.J. (Eds.), *Handbook of Psychology: Industrial and Organizational Psychology*. John Wiley and Sons Inc., Hoboken, NJ, pp. 171–192.
- Krueger, A., Rouse, C., 1998. The impact of workplace education on earnings, turnover, and job performance. *Journal of Labor Economics* 16, 61–94.
- Lengermann, P.A., 1996. The benefits and costs of training: a comparison of formal company training, vendor training, outside seminars, and school based training. *Human Resource Management* 35, 361–381.
- Leonard-Barton, D., 1992. The factory as a learning laboratory. *Sloan Management Review* 34, 23–38.
- Lopez-Cabrales, A., Valle, R., Herrero, I., 2006. The contribution of core employees to organizational capabilities and efficiency. *Human Resource Management* 45, 98–109.
- MacDuffie, J.P., 1995. Human resource bundles and manufacturing performance: organizational logic and flexible production systems in the world auto industry. *Industrial Labor Relations Review* 48, 197–221.
- MacDuffie, J.P., Kochan, T.A., 1995. Do US firms invest less in human resources? Training in the World Auto Industry. *Industrial Relations* 34, 147–168.
- MacKenzie, P., Podsakoff, M., Jarvis, C., 2005. The problem of measurement model misspecification in behavioural and organizational research and some recommended solutions. *Journal of Applied Psychology* 90, 710–730.
- Marks, M.A., Zaccaro, S.J., Mathieu, J.E., 2000. Performance implications of leader briefings and team-interaction training for team adaptation to novel environments. *Journal of Applied Psychology* 85, 968–971.
- McGill, M.E., Slocum, J.W., 1993. Unlearning the organization. *Organizational Dynamics* 22, 67–79.
- McGill, M.E., Slocum, J.W., Lei, D., 1992. Management practices in learning organizations. *Organizational Dynamics* 21, 5–18.
- Mueller, F., 1996. Human resources as strategic assets: an evolutionary resource-based theory. *Journal of Management Studies* 33, 757–785.
- Murray, B., Raffaele, G.C., 1997. Single-site, results-level. Evaluation of quality awareness training. *Human Resource Development Quarterly* 8, 229–245.
- Nevis, E., Dibella, A., Gould, J., 1995. Understanding organizations as learning systems. *Sloan Management Review* 36, 73–85.
- Nonaka, I., Takeuchi, H., 1995. *The Knowledge-creating Company*. Oxford University Press, New York, USA.
- Perez Lopez, S., Montes Peon, J.M., Vazquez Ordas, C.J., 2006. Human resource management as a determining factor in organizational learning. *Management Learning* 37, 215–239.
- Pierce, J.L., Delbecq, A.L., 1977. Organization structure, individual attitudes and innovation. *Academy of Management Review* 2, 27–37.
- Popadiuk, S., Choo, S.W., 2006. Innovation and knowledge creation: how are these concepts related? *International Journal of Information Management* 26, 302–312.
- Rauch, A., Frese, M., Utsch, A., 2005. Effects of human capital and long-term human resources development and utilization on employment growth of small-scale businesses: a causal analysis. *Entrepreneurship Theory and Practice* 29, 681–698.
- Rhodes, J., Lok, P., Hung, R.Y.Y., Fang, S.C., 2008. An integrative model of organizational learning and social capital on effective knowledge transfer and perceived organizational performance. *Journal of Workplace Learning* 20, 245–258.
- Schonewille, M., 2001. Does training generally work? Explaining labour productivity effects from schooling and training. *International Journal of Manpower* 22, 158–172.
- Senge, P.M., 1990. *The Fifth Discipline: The Art and Practice of the Learning Organization*. Random House, London.
- Sinkula, J.M., 1994. Market information processing and organizational learning. *Journal of Marketing* 58, 35–45.
- Slater, S.F., Narver, J.C., 1994. Market oriented isn't enough: build a learning organization. In: *Marketing Science Institute Report*, N. 94-103. Marketing Science Institute, Cambridge, MA.
- Slater, S.F., Narver, J.C., 1995. Market orientation and the learning organization. *Journal of Marketing* 59, 63–74.
- Smith-Jentsch, K.A., Salas, E., Brannick, M.T., 2001. To transfer or not to transfer? Investigating the combined effects of trainee characteristics, team leader support, and team climate. *Journal of Applied Psychology* 86, 279–292.
- Sørensen, J.B., Stuart, T.E., 2000. Aging, obsolescence, and organizational innovation. *Administrative Science Quarterly* 45, 81–112.
- Storey, D.J., 2004. Exploring the link, among small firms, between management training and firm performance: a comparison between the UK and other OECD countries. *Journal of Human Resource Management* 15, 112–130.
- Subramaniam, M., Youndt, M.A., 2005. The influence of intellectual capital on the types of innovative capabilities. *Academy of Management Journal* 48, 450–463.



- Thang, N.N., Buyens, D., 2008. Training, organizational strategy and firm performance. *Business Review* 11, 176–183.
- Tharenou, P., Saks, A.M., Moore, C., 2007. A review and critique of research on training and organizational-level outcomes. *Human Resource Management Review* 17, 251–273.
- Tippins, M.J., Sohi, R.S., 2003. IT competency and firm performance: is organizational learning a missing link. *Strategic Management Journal* 24, 745–761.
- Tohidi, H., Seyedaliakbar, S.M., Mandegari, M., 2012. Organizational learning measurement and the effect on firm innovation. *Journal of Enterprise Information Management* 25, 219–245.
- Tsang, E.W.K., 1997. Organizational learning and the learning organization: a dichotomy between descriptive and prescriptive research. *Human Relations* 50, 73–89.
- Ulrich, D., Jick, T., Von Glinow, M., 1993. High impact learning: building and diffusing learning capability. *Organizational Dynamics* 22, 52–66.
- Valle, R., Martin, F., Romero, P.M., Dolan, S.L., 2000. Business strategy, work process and human resource training: are they congruent? *Journal of Organizational Behaviour* 21, 283–297.
- Velada, R., Caetano, A., 2007. Training transfer: the mediating role of perception of learning. *Journal of European Industrial Training* 31, 283–296.
- Wall, T.D., Wood, S.J., 2005. The romance of human resource management and business performance, and the case for big science. *Human Relations* 58, 429–462.
- Wiley, J.W., 1991. Customer satisfaction. *Human Resource Planning* 14, 117–127.
- Wright, P.M., Dunford, B.B., Snell, S.A., 2001. Human resources and the resource based view of the firm. *Journal of Management* 27, 701–721.
- Wright, P.M., McCormick, B., Sherman, W.S., McMahan, G.C., 1999. The role of human resource practices in petro-chemical refinery performance. *International Journal of Human Resource Management* 10, 551–571.