

Environmental knowledge, unlearning, and performance in hospitality companies *

Abstract

Purpose

The Spanish hospitality industry is facing environmental challenges which require organisations and individuals to learn new skills and practices and create new environmental knowledge.

Methodology / Approach

This paper analyses the relationships between an unlearning context and environmental knowledge and tries to identify whether environmental knowledge impacts on business outcomes through an empirical study of 127 Spanish hospitality companies.

Findings

The results support the hypothesis that, in order to create environmental knowledge and hence foster the application of new environmental knowledge, companies need to provide and support an unlearning context.

Research implications

It is important that managers provide an appropriate unlearning context to support the openness of individuals to new ideas and environmental awareness.

Practical implications

This study provides hotel managers with a better understanding of the relationship between environmental knowledge and organizational outcomes and highlight that managers need to provide and support an unlearning context, which is customised and based on three frameworks: 1) the framework for examining the lens through which individuals view situations; 2) the framework for changing individual habits and 3) the framework for consolidating emergent understandings.

Keywords: unlearning context, individual forgetting, environmental knowledge.

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1. Introduction

The existence of mankind is faced with several linked environmental challenges (e.g. the impact of land degradation and climate change, the management of aid-generated waste, etc). Since many of these problems are caused primarily by business activities, looking to the future, many organisations are making great advances in meeting environmental challenges, though difficulties and tensions remain common. Addressing these challenges will require more than just guidelines and ad hoc activities: it will entail a wholesale cultural and institutional change across the humanitarian community (Erdogan and Tosun, 2009). Positive trends include ever-increasing stakeholder involvement; cooperative partnerships; active engagement of multilateral lenders; increasing multicompany collaboration in addressing regional concerns; and accelerating emphases on technology transfer, training, and capacity building through formal partnerships and alliances.

Considering the rising awareness of global ecological issues, consumers and ecological lobbies will increasingly require companies to accelerate the implementation of environmental management strategies (Brockhoff *et al.*, 1999). They will also force organisations to respect anti-pollution laws, in particular the polluter-payer principle, which in economic terms corresponds to the "internalisation of environmental negative externalities" (Carmona-Moreno *et al.*, 2004). In doing so, chief executive officers and managers with responsibility for aspects of innovation have to face important requirements not only in financial terms but also in terms of learning new knowledge (e.g. skills and practices) to address the broader agenda of sustainable development (Boiral, 2002). The knowledge that contributes best to environmental improvement is 'knowledge' that supports what we have called "environmental knowledge" (Cegarra *et al.*, 2010). There are many

different definitions of environmental knowledge, although almost all of the most widely accepted ones are similar and define it as comprising the store of data, information and knowledge (i.e. environmental memories) that have been accumulated about environmental issues by an organisation throughout its history (Boiral, 2002).

Another more simple way of looking at environmental knowledge is to view it as a kind of general knowledge, which includes the concepts of environmental protection, the natural environment and ecosystems (Fryxel and Lo, 2003). A fundamental problem with these concepts of "environmental knowledge" is that the environmental dimension relates both to the purpose of the knowledge and to the environmental effects of the resulting knowledge (Cegarra *et al.*, 2010). On the one hand, environmental knowledge can be considered simply as the degree to which leaders express concern about ecological issues (Amyx *et al.*, 1994), which in turn inspire and lead their organisations to environmental attention and sustainable purposes (Boiral, 2002). On the other hand, other authors suggest that environmental knowledge can bring competitive advantages to organisations, as the environment is a public concern and thus the company image is reinforced (Roy *et al.*, 2001). In this study, we propose that this knowledge helps organisations to achieve success and business benefits, reducing the environmental impact of carrying out particular kinds of activities in terms of consuming fewer resources, producing less waste and creating less environmental harm (Clayton *et al.*, 1999).

Previous studies in business management confirm that the numerous failures in the implementation of environmental cultures are a consequence of incompatible knowledge, such as unsupportive organisational cultures, attitudes and behaviour of senior managers, line managers and colleagues (Sena and Dumke, 2004; Gadenne *et al.*, 2009). In this paper, we

argue that the reasons why companies create environmental knowledge depend on a team's ability to integrate, build, and reconfigure internal and external competences to transform a firm's assets and competencies (Sena and Dumke, 2004; Gadenne *et al.*, 2009). This ability resembles the concept of unlearning (Hedberg, 1981; Akgun *et al.*, 2003). Many previous studies have examined the importance of unlearning (e.g., Starbuck, 1996; Akgun *et al.*, 2003). However, previous studies on unlearning are limited with respect to environmental concerns and are limited by their focus on the conceptual stage and assumption that organisational knowledge results from existing organisational or team routines and beliefs (e.g., Nonaka and Takeuchi, 1995; Zollo and Winter, 2002).

In this study we assert that environmental outcomes require teams to change their existing beliefs and routines (unlearning) in the innovative process of creating environmental knowledge (Akgun *et al.*, 2006). In this regard, there is no empirical evidence, particularly in relation to Spanish hospitality companies, to support the concept of an unlearning context and how it relates to environmental knowledge, or to the improvement of organisational outcomes. In this paper we test our postulated hypotheses about such relationships, the unlearning context, environmental knowledge and the improvement of organisational outcomes. These relationships are examined through an empirical investigation of 127 Spanish hospitality companies. The sub-processes that characterise the unlearning context and environmental knowledge are discussed in detail in the following section. Section 2 also investigates the development of hypotheses as to how the unlearning context and the environmental knowledge contribute to business outcomes. Details of the survey which was used to collect appropriate data to test the models is presented in section 3, whilst the results of testing the models are presented in section 4, followed by a discussion in section 5.

2. Conceptual Framework

2.1 Environmental Knowledge

Environmental protection has become one of the world's most important priorities in order to attain sustainable development (Nouri *et al.*, 2008). The growing interest of tourists in the environment has led to the promotion of ecotourism, and with it the search to develop environmental and economically feasible strategies based on environmental knowledge (Brockhoff *et al.*, 1999). This means that environmental knowledge involves what people know and are concerned about regarding the natural environment, their responsibilities towards environmental protection and the relationship between the economy and sustainable development (Po-Shin and Li-Hsing, 2009). As Frick *et al.* (2004) suggest, people with this knowledge will know what can be done about environmental problems and they understand the benefits of environmentally responsible actions.

In this paper, we define environmental knowledge as embedded explanatory, instrumental and evaluative knowledge, offering the 'why' and 'how' for the internal organisational agents (i.e. shareholders, management, and employees). The goal of this 'environmental knowledge' will be that all members of the organisation are conscious of where useful complementary abilities reside such as: Who knows what? Who can help with that? Who can exploit environmental information? (Frick *et al.*, 2004). It includes: prior data and information; all internally-generated documentation connected to the environmental activities of the organisation, such as ISO 14001; energy reduction systems; waste recycling programmes and proper environmental designs whose ownership is granted to the company by law, licensing and partnering agreements (Boiral, 2002); and, importantly, institution-created image (Boiral, 2006; 2009).

Two theories provide insights on why firms develop environmental knowledge. On one hand, the economic approach describes firms' adoption behavior as driven by performance outcomes. This line of research seeks to identify the circumstances when it pays to be "green" and that managers exhibit rational behaviour when they adopt "beyond compliance" practices (Russo and Fouts, 1997; King and Lenox, 2001). From this perspective, environmental knowledge will lead to increased company benefits such as cost savings resulting from eco-efficiency, enhanced corporate image, improved relationships with local communities, access to new green markets and a superior competitive advantage, among others (Rondinelli and Vastag 2000; Zhang *et al.*, 2000). A second line of research, rooted in institutional sociology, proposes that firms respond to institutional pressures (Hoffman and Ventresca, 2002). The institutional sociology framework emphasises the importance of regulatory, normative and cognitive factors that affect firms' decisions to adopt a specific environmental practice. In terms of organisational outcomes, hotels will achieve higher levels of customer satisfaction and commitment through environmental knowledge by focusing innovation efforts on problems that are more important for the hotel and its customers, which in turn facilitates the easy retrieval of relevant information, and is a factor in superior performance (Sinkula *et al.*, 1997).

2.2 Unlearning

In the last decade and a half there has been a dramatic increase in interest in the concept of "unlearning" and the related concept of "forgetting" in both an individual and organisational context (e.g., De Holan and Philips, 2004; Becker, 2005: 2008: 2010; Cegarra and Sanchez, 2008). While forgetting refers to the apparent loss of knowledge already learned in an individual's long term memory (Smunt, 1987; De Holan and Philips, 2004), unlearning makes room for the development of new adaptive capacities at an organisational level (Hedberg,

1981; Nystrom and Starbuck, 1984; Starbuck, 1996). Considering these initial contributions, we argue that although there is a significant overlap between the concepts of forgetting and unlearning, the two processes are not identical. On the one hand, unlearning encourages the challenging of accepted assumptions, values and norms as a prior step to considering whether anything can be learnt (Hedberg, 1981; Nystrom and Starbuck, 1984), and it is an adaptation process where the new knowledge and knowledge structures have to replace old knowledge and knowledge structures (Nonaka *et al.*, 2001; Akgün *et al.*, 2007). On the other hand, forgetting is a failure to become mindful at the proper time (De Holan and Philips, 2004), for example, when someone forgets oneself and loses one's dignity, temper or self-control.

The problem with the extension of the definition of forgetting as outlined above is that the accidental loss of knowledge (e.g. having a short memory), is casual, indeed it is unexpected, and it certainly does imply the necessity for the replacement or adjustment of prior knowledge structures (Smunt, 1987). In this regard, it should be noted that in recent organisational learning research literature, the term 'forgetting' has been analysed from two different but related perspectives: intentional and accidental forgetting (Darr *et al.*, 1995; Fernandez and Sune, 2009). While accidental forgetting sees unwanted forgetting as a degradation of the stocks of organisational knowledge (e.g. accidental loss of documents on a computer by human error or mechanical breakdown, failure to preserve adequate documentation in order to interpret reports or sensor readings, etc.), intentional forgetting requires that certain routines, rules, tasks, roles, policies, values and strategies need to be actively and intentionally forgotten before new organisational knowledge can be acquired and assimilated (Lei *et al.*, 1999).

This research focuses on intentional forgetting or what others (e.g., Hedberg, 1981; Akgün *et al.*, 2007) refer to as “intentional unlearning”. Most authors who adopt this perspective refer to unlearning as an intentional process of discarding obsolete and misleading knowledge, and as one way to address the discrepancy between the current reality and the existing body of knowledge. In order to enable intentional unlearning, several approaches have been described in previous studies. Nystrom and Starbuck (1984), for instance, suggest that the way to unlearn during an organisational crisis is to remove top managers as a group. This is because managers take incorrect or inappropriate assumptions for granted, which have in the past been a source of certainty and security. Change in ownership is often another trigger of unlearning (Markoczy, 1994). When an organisation is acquired by another, some restructuring in the acquired company takes place in order to align its routines and processes.

According to Starbuck (1996) and more recently Becker (2005: 2008: 2010), unlearning may be facilitated by the creation of an ‘awareness’ in the individual that there is a new way of understanding a particular phenomenon or situation (or technology), along with the creation of a desire by the individual to ‘relinquish old ideas’. In order to enable organisational self-renewal and innovation through the self-awareness by members of the organisation, the ‘unlearning context’ and its different sub-dimensions, are frequently cited as antecedents for the elimination of old logic at the individual level and making room for new ones to occur at the organisational level (Becker, 2005: 2008). As Akgün *et al.* (2007) indicate, organisational unlearning is operationalised as changes of processes and routines in the organisation. In this paper, we have followed the suggestion of Cegarra and Sanchez (2008) that the unlearning context should be measured using three sub-dimensions:

- a) The examination of lens fitting. This refers to an interruption of the employees' habitual, comfortable state of being and it is through such a framework that individuals in an organisation will have access to new perceptions.
- b) The framework for changing the individual habits. This refers to the challenge of inhibiting wrong habits when an individual has not only understood the new idea but is quite motivated to make the change.
- c) The framework for consolidating emergent understandings. This refers to the organisational process that can free employees up to apply their talents by implementing new mental models based on adaptation to new knowledge structures.

2.3 Linking intentional unlearning with environmental knowledge

Environmental scanning is the acquisition of information about events, trends, and relationships in an organisation's external environment, the knowledge of which would assist management in planning the organisation's future course of action (Choo and Auster, 1993). The creation of environmental knowledge supposes, in each case, the reactivation and development of new information which, in turn, fosters learning and then the integration of new knowledge in members of the organisation. As Boiral (2002) points out, this knowledge includes employee compliance with new practices. Some of these new practices include the exchange of information and sharing of environmental concerns (Fryxel and Lo, 2003), the acceptance of constraints related to the prevention of pollution (Cordano and Frieze, 2000), and collaboration with technical services to develop cleaner processes (Aggeri, 1999).

Sometimes, however, in order to learn something new, it is necessary to eliminate something else that is already known (e.g. Hedberg, 1981; Nystrom and Starbuck, 1984; Huber, 1991). For example, gardeners may need to unlearn what they already know about the routine use of

chemical herbicides and pesticides if they want to use organic fertilizers. As experience is gained, gardeners become familiar with and confident in the use of organic fertilizers. The old ways of doing things recede, prior expectations fade, discomfort is reduced, and unlearning takes place. Under these circumstances, the atmosphere most likely to induce self-renewal and essentially correct this state of affairs is one that promotes openness to new ideas and the critical evaluation of signals that are contrary to established beliefs and values (Levinthal and March 1993; Akgün *et al.*, 2007; Marcati *et al.*, 2008). If this is correct, the unlearning context shown above is not only a way to forget old knowledge but also the way that companies are able to relearn and develop new knowledge. As Sinkula *et al.* (1997) noted, as workers relearn they also unlearn and new knowledge replaces old routines as the workers forget.

The considerations above imply that the presence of an internal context that fosters the replacement of old knowledge could be essential for organisations that try to create environmental knowledge (e.g. a change of attitude). At its heart, this context attempts to re-orientate organisational values, norms and/or behaviour by changing cognitive structures (Nystrom and Starbuck, 1984), mental models (Day and Nedungadi, 1994), dominant logic (Bettis and Prahalad, 1995) and core assumptions which guide behaviour (Shaw and Perkins, 1991). Thus, we argue that it is through the implementation of processes that result in the establishment of an ‘unlearning context’ that members of an organisation are able to identify outdated procedures, rules and processes. In addition, it becomes possible to identify values, behaviours, attitudes and habits that have become inappropriate (Huber, 1991). Such questioning may also lead to new interpretations of existing knowledge or the elimination of what was formerly considered to be knowledge or accepted wisdom (Nonaka and Takeuchi, 1995). The hypothesis we propose under this framework is:

H1: The unlearning context is positively associated with the creation of environmental knowledge

The ideas above provide an illustration that it is the positive outcomes stemming from environmental knowledge that in turn improve hotel outcomes (Russo and Fouts, 1997; King and Lenox, 2001). For example, hotel operators encourage their guests to participate in programmes to reuse their towels. These programmes benefit the environment but they also reduce laundry expenses. The existence of environmental knowledge provides arguments to convince the public to use the installations and services of hotels (Carmona-Moreno *et al.*, 2004), and provides a starting point to bring together hotels and customers in the implementation of a knowledge creation network from which the overall environmental policy and goals can derive (Kuhre, 1998). As Boiral (2002) noted, the existence of environmental knowledge helps both companies and customers obtain beneficial results. Among other benefits of creating environmental knowledge, academics highlight improvement in public image as the company is seen to be socially responsible (Erdogan and Tosun, 2009). There are also other more tangible benefits, such as reduction of consumption of water per guest, lower consumption of energy per habitational unit, higher levels of consumption of cleaning products per square meter, smaller amounts of residues produced monthly per guest, productivity, satisfaction, commitment among customers and a greater degree of conformity with urban legislation and the environment (Morrow and Rondinelli, 2002; Carmona-Moreno *et al.*, 2004;). Therefore, we propose:

H2: The existence of environmental knowledge will determine the extent to which the company achieves better organisational outcomes

3. Method

3.1. Data collection

The Spanish hotel operator industry was the subject of the data collection. The Spanish hotel operator industry is very relevant to the Spanish economy (Cadarsó, 2005). Spain ranks second in the world in this sector, both in terms of the number of travellers (behind France) and in terms of income from tourism (behind the USA) (WTO, 2009). This industry gave Spain 11.8% of its gross domestic product (GDP) for 2002 and 12.1% for 2001 (Claver-Cortés *et al.*, 2006). Regarding the employment generated by the tourism sector, estimates indicate that it usually absorbs 10% of the total employment available in Spain. From the total Spanish population, over two hundred thousand people worked in hotels and guesthouses in August 2003 (National Statistics Institute Information Bulletin, 2003).

The Spanish hotel operator industry was chosen for two main reasons, namely: its economic importance and the fact that it is facing increasing environmental challenges. For example, hotels have to contend with high fixed costs. The management often has to worry about staff wages, significant utility bills and the expense of maintaining rooms and facilities. Managing a profitable hotel is not an easy task, particularly in a recession. In this regard, the tourist industry did not contribute to the growth of the Spanish economy for the first time ever in 2008 and, in fact, decreased 1.1% with respect to 2007 (National Statistics Institute Information Bulletin, 2008). Also, the Spanish hotel operator industry is an appropriate setting for an investigation of unlearning and its impact on environmental knowledge because these companies have to face up to highly dynamic environments, strong competition and rapid advances in technology. As Carmona-Moreno *et al.* (2004) state, the environmental policy in hotels is fundamental because their organisational results depend essentially on the

environment in which they are located and the preservation of that environment becomes a crucial factor in their business. These all require the intensive use of new beliefs, norms, values, procedures, and routines.

A list of 245 Hotel operators provided by the SABI¹ database was used as an initial sampling frame. All the companies were included in the CNAE²-551. The businesses were contacted and asked by the researchers to participate in the study before the survey was carried out. The potential participants were informed by telephone of the objectives of the research. They were assured of its strictly scientific and confidential character and that data would be treated globally and anonymously. The unit of analysis for this study was the company, on the assumption that aspects relating to the examination of lens fitting, the changing of individual habits, the consolidation of emergent understandings and the creation of environmental knowledge affect the entire organisation. The data was collected through telephone interviews with the CEO or owner of the business using a simple structured questionnaire. The individual addressed was expected to have a broad overview of the innovative issues studied in this paper. Respondents were asked about environmental activities carried out by their hotels and unlearning processes implemented to create environmental knowledge in a context of intensive innovation.

Surveying took place over a period of month, from early September to early October 2008. From a sample of 245 companies, the total number of participants was 127 companies (41 companies have 10-49 employees, 59 companies have 50-249 employees, 18 companies have 250-499 employees and 9 companies have more than 500 employees). This resulted in a

¹ SABI: Sistema de Análisis de Balances Ibéricos. This database contains financial information for 520,000 companies (480,000 from Spain and 40,000 from Portugal). This includes public and private, Spanish and Portuguese companies, with up to 10 years of data, updated daily.

² CNAE-551: The Spanish National Classification of Economic Activities 551.

response rate of 51.83% with a factor of error of 6% for $p=q=50\%$ and a reliability level of 95.5%. This high response rate indicated the high quality of the sampling procedure and, also, it was apparent that informants perceived the research as relevant and worthwhile. A comparison between companies who had answered and companies who had not answered yielded no significant differences relevant to turnover, total assets and number of employees, which suggested that non-response bias was not a problem (Armstrong and Overton, 1977). In addition, the size of the sample was considered sufficient because since it was greater than ten times the number of predictors from the indicators on the most complex formative construct or antecedent construct leading to an endogenous construct (Hair *et al.*, 1998).

3.2 Measures

Churchill's (1979) approach to questionnaire development was used, combining scales from several other relevant empirical studies with new items to make an initial list of 15 items (3 measuring the range of the examination of lens fitting; 3 measuring the existence of conditions facilitating the changing of individual habits, 3 measuring the framework for consolidating emergent understandings, 3 measuring the existence of environmental knowledge and 3 relating to environmental outcomes). Several items were modified through interviews with colleagues and a first draft of the questionnaire was tested with three hotels. Appendix 1 provides an overview of the final questions used in the questionnaire. The questionnaire constructs were as follows:

- Three-dimensions form the unlearning context: 'consolidation of emergent understandings', 'the examination of lens fitting', and 'the framework for changing individual habits'. The initial scale comprises nine items taken from a scale designed by Cegarra and Sánchez (2008) to quantify the construct of an unlearning context.

Consequently, the framework for examining the lens fitting was measured using three items which recognise the support of policies, rules, reporting, structures and decision-making protocols that encourage the identification of problems, mistakes and new ways of doing things. To measure the process for ‘changing individual habits’, three items were used. This scale focuses on self-awareness issues about our own mistakes, ways of thinking and wrong behaviour that guide our everyday attitudes. The measures relating to the existence of a process for ‘consolidating the emergent understandings’ describe the way organisational members faced up to change, introduced it actively into the company through projects, collaborated with other members of the organisation, and recognised the value of new information or taking risks.

- Environmental knowledge was measured using a scale of three items taken from previous studies (Boiral, 2002). These items recognise support of policies, rules, reporting structures and decision-making protocols that encourage the introduction of clean technologies and approaches to reduce pollution that often leads to substantial savings of material and energy.
- In this study, the measurement of organisational outcomes is based on the stakeholder approach, which considers the different types of perceived benefits that are gained by managers. Perception of organisational outcomes required an assessment of the firm’s performance over the past three years relative to the performance of industry competitors (Dollinger and Golden, 1992; Powell, 1992). We used three items from Delaney and Huselid (1996). Sample items include development of new products, services, or programmes, and customer satisfaction.

3.3 Assessment of the measures

In order to obtain a robust evaluation of the quality of the seventeen items, a confirmatory analysis (CFA) was achieved using the covariance matrix as input via the EQS 6.1 robust maximum likelihood method (Bentler, 1988). As our model uses reflective indicators of a principal factor latent construct and our data is non-normal, other structural equation modelling software packages (e.g. LISREL or AMOS) cannot be applied in these circumstances (e.g. Diamantopoulos and Winklhofer, 2001). The CFA produced a good fit with an incremental fit index (IFI) of 1 and a comparative fit index (CFI) of 1 (also, Satorra-Bentler $\chi^2_{(80)}=67.557$; $\chi^2/d.f=0.844$; GFI=0.936; and RMSEA=0.030).

From an examination of the results shown in Table 1, we can state that all of the constructs are reliable. For all the measures, Bagozzi and Yi's (1988) composite reliability index and Fornell and Larcker's (1981) average variance extracted index are higher than the evaluation criteria of 0.7 for composite reliability and 0.5 for the average variance extracted. These results suggest the use of three scales to measure the framework for examining the lens fitting (AVE=0.607; SCR=0.822), three to measure the framework for changing the individual habits (AVE=0.628, SCR=0.834), three items to measure the consolidation of emergent understandings (AVE=0.649, SCR=0.846), three to measure the environmental knowledge (AVE=0.609, SCR=0.823) and finally another three to measure the organisational outcomes (AVE=0.667, SCR=0.857).

Insert Table 1 about here

Discriminant validity was determined by comparing the square root of the AVE (i.e., the diagonals in Table 2) with the correlations among constructs (i.e., the lower triangle of the

matrix in Table 2). On average, each construct related more strongly to its own measures than to others (Fornell and Larcker, 1981). In the interest of thorough discriminant validity, an additional test was examined, which supports this assumption since the confidence interval (± 2 standard errors) around the correlation estimated between any two latent indicators never includes 1.0 (Anderson and Gerbing, 1988). The constructs correlation matrix, shared variances, means and standard deviations are shown in Table 2.

Insert Table 2 about here

The unlearning context (UC) was operationalised as a second-order construct with three reflective dimensions (i.e. the three facets of the unlearning context). A second-order confirmatory factor analysis of a model depicting consolidation of emergent understandings, the examination of lens fitting and the framework for changing individual habits was conducted. From an examination of the results shown in Table 3, this model yielded acceptable fit indices (Satorra-Bentler $\chi^2_{(24)} = 18.788$; $\chi^2/d.f = 0.782$; GFI=0.968; CFI=1.000; IFI=1.000; RMSEA= 0.051). In addition, all first-order and second-order factor loadings were significant, thereby providing evidence that UC is a multifaceted construct, construed from consolidation of emergent understandings, the examination of lens fitting and the framework for changing individual habits. Hence, the second-order factor model demonstrated a composite UC in this study.

Insert Table 3 about here

4. Results

Once the psychometric properties of the measures had been checked, the next step was the evaluation of the hypothesised relationships developed from consideration of the relevant literature (see Figure 1), discussed in the text as H1–H2. The fit of the model is satisfactory (Satorra-Bentler $\chi^2_{(85)}=91.732$; $\chi^2/d.f=1.079$; GFI=0.912; CFI=0.992; IFI=0.992; RMSEA=0.056), thereby suggesting that the nomological network of relationships fits our data – another indicator of support for the validity of these scales (Churchill, 1979). Figure 1 shows that the unlearning context had a positive influence on the existence of environmental knowledge at a level of ($p<0.01$). Figure 1 also shows that the existence of environmental knowledge at a level of ($p<0.01$) had a significant effect on organisational outcomes. Together, these results provided full support for H1: (unlearning context \rightarrow environmental knowledge), and also for H2: (environmental knowledge \rightarrow organisational outcomes).

Insert Figure 1 about here

The managerial implications of the relationships observed between the factors that constitute the conceptual framework shown in Figure 1 are discussed in more detail below.

5. Discussion

The purposes of this study were to examine the relationship between an unlearning context and environmental knowledge and attempt to identify whether environmental knowledge impacts on business outcomes. In pursuing those aims, we unpack the concept of unlearning by capturing the processes behind the development of an organisational context. The

contribution of that context, described as the ‘unlearning context’, is related to its ability to pave the way for the development of environmental knowledge in organisations. Our findings show that in order to support the existence of environmental knowledge, hotel managers need to provide and support an unlearning context, which is customised and based on three frameworks: 1) the framework for examining the lens through which individuals view situations; 2) the framework for changing individual habits; and 3), the framework for consolidating emergent understandings.

With respect to the test of hypothesis H1, the results support the position that, in order to create environmental knowledge and hence foster the adoption of environmental practices, companies need to provide and support an unlearning context. One interpretation of this relationship is that through the unlearning context, a company can allow individuals to adjust their mental models and the nature of the assumptions shared to break current workplace culture. Because old, outdated knowledge can impede adaptation to new configurations, senior managers need to create a context of continuous unlearning. Without care, organisations can fall into a ‘competence trap’ (Leonard-Barton, 1992), increasingly exploiting poor environmental practices such as the use of non-renewable energy, or they can fall into a ‘failure trap’ (Levinthal and March, 1993), where a failure while exploring environmental opportunities may lead to more research and change, and so to failure again, which leads to more research and so on. We think that this is an important finding, as potential for any hotel to preserve and maintain the natural environment will depend substantially on its ability to learn new ideas and environmental awareness, thus, managers may be trapped in a suboptimal stable equilibrium. Many overloaded managers may be over-investing in the development of technological breakthroughs preserving and following old beliefs and traditions (i.e. the old culture).

The above considerations also imply that an unlearning context can encourage individuals to question not only the information they own but also whether their particular approach to adopt a new environmental practice is applicable or not (Sinkula *et al.*, 1997). Such questioning may also lead to new interpretations of existing knowledge or the elimination of what was formerly considered to be knowledge or accepted wisdom. Moreover, whilst hotels strive to assess and incorporate the value of environmental knowledge, other external organisations like local communities have similar concerns about achieving sustainable development that they could use effectively. The benefits of using and integrating such an unlearning context by local communities as sources of environmental knowledge have not been fully assessed. Therefore, local communities should focus their efforts to foster environmental initiatives not only on external factors (e.g. laws and regulations) but on modifying managers' psychological attributes such as creative thinking and open-mindedness. This accomplishes what authors, such as Morrow and Rondinelli (2002), express when they highlight that the workforce may need to be aware of the environmental aspects of their jobs and of their responsibilities for reducing negative impacts. As Marcati *et al.* (2008) affirm, this could be achieved through specific tools such as communication campaigns or specific training courses that should aim at training creative problem solving, critical thinking, lateral thinking, etc.

With respect to the test of hypothesis H2, the results support the position that business outcomes are likely to suffer if hotels do not create environmental knowledge. This confirms the position adopted by Chin and Pun (1999) when they emphasise that managers perceived positive impacts of adopting environmental practices, including cost savings through the reduction of waste and energy consumption, improved environmental performance, and reduced legal consequences and economic losses. Therefore, for a hotel to grow and prosper

in a sustainable environment, such as the Spanish hospitality industry during the period we have examined, it is necessary for management to foster the existence of environmental knowledge. This is in accordance to the economic approach that emphasises sustainability commitment as driven by performance outcomes (King and Lenox, 2001). Hence, this research highlights the importance of support from the managerial team for environmental initiatives in organisations. This also confirms the views of authors, such as Russo and Fouts (1997), who argue that a valid environmental policy for any business is much more than customer pressure – it is about employee fulfilment and engagement resulting in increased productivity and competitive advantage. For example, some environmental practices, such as cutting carbon emissions from travel to and during work, may significantly contribute to an increase in employee productivity and a decrease in stress. Therefore, the environmental knowledge does benefit the environment but it also increases company productivity. Considering this, we argue that executives and other senior leaders must signal their level of support for addressing environmental issues in order to increase organisational outcomes.

This study has some limitations. First, it has been observed that the existing production facilities and practices in most of the industrial companies, particularly production processes, need to be enhanced so that they become more environmentally friendly (Sena and Dumke, 2004). In this regard, Sena and Dumke detected that companies belonging to the chemical industry have a strong concern with the impacts that this sector can cause to the environment. Consequently, future research, including companies from different sectors (e.g. hospitality, telecommunications and chemical) should analyse the relationship between the company's activity and its environmental knowledge. Secondly, national cultural issues might influence the way organisations promote environmental initiatives. Therefore, it would also be interesting to extend the study to other countries because national cultural issues might

influence the results. Thirdly, only subjective information relating to the measurement of environmental knowledge was used. Objective measures such as ISO 14001 should be used to supplement this subjective information. Although this kind of subjective information is commonly used in studies, the addition of other measures from objective sources would have added to the validity and reliability of the increasing presence of highly codified environmental management systems. In addition, the model presented in this study was general and did not capture the possible moderating effects of environmental turbulence and uncertainty.

Prior research has also shown that the effect of environmental initiatives on organisational outcomes can vary substantially with environmental conditions and therefore, under turbulent conditions, the existence or otherwise of environmental knowledge might produce different results. Therefore, other factors which have not been included in this study are also likely to affect the firm's environmental knowledge. Future research should investigate the link between different initiatives such as reducing waste production and resource and energy consumption by controlling and improving lighting, heating, ventilation, air conditioning, and water use, by making proper purchasing decisions on containers, use of returnable containers and recycling materials and the company goals (Carmona-Moreno *et al.*, 2004). Finally, it may also be interesting to observe the change in the performances of companies after adopting environmental activities, through case studies.

6. Conclusions

The first contribution of this research is to question the existing models which relate to environmental practices and business outcomes. As expected, and consistent with our model,

our results provide an illustration that, in order to create environmental knowledge positively influence organisational outcomes, an organisation must be flexible when configuring (combining) knowledge in a way that is appropriate for delivering value to the company and be effective in updating the actual knowledge of its staff. Put another way, the development of environmental knowledge requires an unlearning context in hotels. This finding is important in the ongoing debate surrounding the relationship between environmental knowledge and business outcomes, and confirms what authors such as Lenox and Ehrenfeld (1997) say when they argue that resources, like information, are insufficient if they are not linked with organisation teams and embedded in interpretative structures, which value and understand the environmental information received.

The ideas above provide an illustration that intentional unlearning could be a necessary task to adopt a new environmental culture that is not compatible with the current culture, especially for those companies urged to voluntarily carry out environmental company practices. As Tsoukas (1996) noted, a bad knowledge creation network proves a cause of difficulties and misalignments to the operational environment of organisational outcomes, mostly due to the peculiar nature of gaps that existed in organisational members knowledge of environmental laws and problems and that current certifications (e.g. EMAS and ISO 14001) would enable the company to avoid noncompliance with federal, state and local laws (Chirico and Salvato, 2008). In this regard, this paper provides a starting point to bring together managers and employees in the creation of environmental knowledge from which practices for the diverse needs of the customers can derive. From our framework, we suggest that any hotel wishing to implement an environmental management system should initially make efforts to update the relevant knowledge of its workforce. This is vital to the processes that are needed to meet the changing needs of building or introducing a new culture.

This study also provides hotel managers with a better understanding of the relationship between environmental knowledge and organisational outcomes and highlight that managers need to set their people clear expectations and goals, understand their individual motivations or acknowledge their efforts. Otherwise, they will undermine any environmental practices. In doing so, the concept of unlearning context was explored by capturing the processes behind this context and testing its impact on the environmental knowledge. We also found that environmental knowledge impacts on the business outcomes. What this could mean for a hotel manager is that an unlearning context is useful for meeting the needs of the environment in real time (live), the framework for examining the lens and the framework for changing individual habits provide information about the wishes and necessities of the customers (e.g. redesigning the practice at the same time as customer demands), by the framework for consolidating emergent understandings, hotels may reduce the development time for new and/or redesigned environmental practices and gain a competitive advantage (e.g. being the first to pay attention to the needs of the environment). Therefore, the importance of ‘environmental knowledge’ to cognitively diverse teams relates to enhancement of technical, administrative and social approaches through the accurate understanding of the information available to the group and where it is located in terms of environmental initiatives.

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Appendix 1: Questionnaire items

The examination of lens fitting: with respect to your current position indicate the degree of agreement or disagreement (1= high disagreement and 10= high agreement):
ELF ₁ : Employees are able to see mistakes from their colleagues ELF ₂ : Employees are able to identify problems (new ways of doing things) easily ELF ₃ : Employees are able to listen to my customers (e.g. complaints, suggestions) (Source: Cegarra and Sánchez, 2008)
The framework for changing the individual habits: with respect to your personal skills indicate the degree of agreement or disagreement (1= high disagreement and 10= high agreement):
CIH ₁ : New situations have helped individuals recognise unwanted attitudes CIH ₂ : Individuals recognise forms of reasoning or arriving to solutions as inadequate CIH ₃ : New situations have helped individuals identify improper behaviours (Source: Cegarra and Sánchez, 2008)
The consolidation of emergent understandings: with respect to your organisation indicate the degree of agreement or disagreement (1= high disagreement and 7= high agreement):
CEU ₁ : Managers seem to be open to new ideas and new ways of doing things CEU ₂ : Managers adopt the suggestions of personnel in the form of new routines and processes CEU ₃ : Management has tried to initiate projects and introduce innovations (Source: Cegarra and Sánchez, 2008)
Environmental knowledge (EK): with respect to their competitors indicate the degree in which your company reached the following objectives (0= did not reach and 10= strongly reached).
EK ₁ : The company (hotel) uses less polluting industrial processes and products EK ₂ :The company (hotel) has developed a green programme (waste management, control of effluents, inventory of pollution sources) EK ₃ :The company (hotel)has an environmental policy (Source: Boiral, 2002)
Organisational outcomes: with respect to their competitors indicate the degree in which your company reached the following objectives in the last three years (1= did not reach and 10= strongly reached).
OO ₁ : Quality of products, services and programmes OO ₂ : Development of new product, services and products OO ₃ : Satisfaction of customers (Source: Delaney and Huselid, 1996)

Table: 1. Factor loadings of the resulting items and scale reliability

Construct		Standardize d loading	t-value	Reliability (SCR ^a , AVE ^b)
The framework for the examination of lens fitting (ELF)				
	ELF ₁	0.876	4.048	AVE=0.607
	ELF ₂	0.873	3.289	SCR=0.822
	ELF ₃	0.817	4.593	
The framework for changing the individual habits (CIH)				
	CIH ₁	0.724	4.427	AVE=0.628
	CIH ₂	0.889	3.116	SCR=0.834
	CIH ₃	0.839	3.928	
The consolidation of emergent understandings (CEU)				
	CEU ₁	0.829	4.613	AVE=0.649
	CEU ₂	0.676	4.582	SCR=0.846
	CEU ₃	0.832	4.264	
Environmental knowledge (EK)				
	EK ₁	0.770	5.209	AVE=0.609
	EK ₂	0.876	4.120	SCR=0.823
	EK ₃	0.899	3.282	
Organizational outcomes (OO)				
	OO ₁	0.708	5.124	AVE=0.667
	OO ₂	0.703	5.834	SCR=0.857
	OO ₃	0.810	4.155	

Notes:

The fit statistics for the measurement model were:

Satorra-Bentler $\chi^2_{(80)}=67.557$; $\chi^2/d.f=0.844$; GFI=0.936; CFI=1.000; IFI=1.000; RMSEA=0.030.

^a Scale Composite Reliability (SCR) of $p_c = (\sum \lambda_i)^2 \text{var}(\xi) / [(\sum \lambda_i)^2 \text{var}(\xi) + \sum \theta_{ii}]$ (Bagozzi and Yi, 1998).

^b Average variance extracted (AVE) of $p_c = (\sum \lambda_i^2 \text{var}(\xi)) / [(\sum \lambda_i^2 \text{var}(\xi) + \sum \theta_{ii})]$ (Fornell and Larcker, 1981).

The asymptotic covariance matrices were generated to obtain the scaled chi-square (Satorra and Bentler, 1988) and robust estimation of standard errors.

Table 2 Construct correlation matrix

	Mean	S.D	CA	Correlation matrix					
				1	2	3	4	5	
1. Examination of lens fitting (range 0–10)	6.677	2.113	0.883	<i>0.907</i>					
2. Changing the individual habits (range 0–10)	6.055	2.449	0.856	0.457	<i>0.913</i>				
3. Consolidation of understandings (range 0–10)	6.795	2.244	0.812	0.490	0.345	<i>0.920</i>			
4. Environmental knowledge (range 0–10)	6.252	2.199	0.881	0.422	0.418	0.406	<i>0.907</i>		
5. Organizational outcomes (range 3–7)	5.320	0.900	0.779	0.501	0.346	0.285	0.355	<i>0.926</i>	

Notes:

Mean = the average score for all of the items included in this measure; S.D. = Standard Deviation; CA = Cronbach's Alpha; Intercorrelations are presented in the lower and shady triangle of the matrix. The bold numbers on the diagonal are the square root of the Average Variance Extracted.

Table 3 Second-order confirmatory factor analysis of the unlearning context

First-order construct	Indicator	First-order		Second-order	
		Loading	<i>t</i> -value	Loading	<i>t</i> -value
Framework for examining the lens fitting (ELF)	ELF ₁	0.879	- ^a	0.868	7.919
	ELF ₂	0.869	8.056		
	ELF ₃	0.818	6.630		
Framework for changing the individual habits (CIH)	CIH ₁	0.727	- ^a	0.602	4.785
	CIH ₂	0.876	6.020		
	CIH ₃	0.851	5.966		
Framework for consolidating the emergent understandings (CEU)	CEU ₁	0.816	- ^a	0.654	5.386
	CEU ₂	0.677	8.504		
	CEU ₃	0.843	7.426		

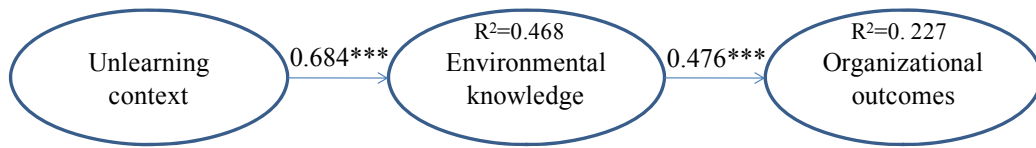
Notes:

Fit statistics for measurement model of 9 indicators for three constructs:

Satorra-Bentler $\chi^2_{(24)} = 18.788$; $\chi^2/d.f. = 0.782$; GFI=0.968; CFI=1.000; IFI=1.000; RMSEA= 0.051.

^aFixed parameter.

Figure 1: Model statistics



Notes:

The fit statistics for the measurement model were:

Satorra-Bentler $\chi^2_{(85)}=91.732$; $\chi^2/d.f.=1.079$; GFI=0.912; CFI=0.992; IFI=0.992; RMSEA=0.056

***p < 0.01