Environmental Knowledge Strategy: Driving Success of the Hospitality Industry

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Environmental knowledge strategy: driving success of the hospitality industry

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Environmental knowledge strategy: driving success of the hospitality industry

Abstract

Purpose

The dynamics of tourism as both an activity and an industry, combined with the growing concerns about the environment, call for continuous efforts in seeking new approaches, tools and perspectives for the acquisition of environmental knowledge by organisations in the hospitality sector. This research has been set to examine the relationships between environmental knowledge, organisational learning and business performance in the context of the tourism sector. Emphasis is made on understanding the process of updating the environmental knowledge base of an organisation through appropriate learning processes within the business.

Design/methodology/approach

Using a structural equation model, feedback received from 87 companies from the Spanish hospitality sector in a longitudinal study consisting of two distinct phases in 2008 and 2014 was studied.

Findings

The results of the analysis indicate that environmental knowledge has a positive impact on business performance. Also, a review of the levels of awareness about environmental problems across the organisation is required at regular intervals (in this research, within a six-years timeframe).

Practical implications

Our focus on the hospitality sector makes this research relevant for a significant number of hotels and their supply chains around the world.

Originality/value

The research addresses the challenges of sustainability and environmental performance from a perspective not previously covered in the extant literature, an approach further improved by the longitudinal nature of this study, performed over a period of six years.

Keywords: environmental knowledge, organisational learning, knowledge exploration, knowledge exploitation, hospitality industry, business performance
1. Introduction

Adaptability, that is, the ability of organisations to remain cognitively flexible to respond to changes in the current, volatile socio-economic context, has long been a key subject of analysis both organisational theory and management. Adaptability is particularly important in the current context, where business strategy is often influenced by a growing global concern about the environment and its protection. An increasing number of organisations are thus embracing environmental and sustainability challenges into their strategies and daily operations (De Marchi and Grandinetti, 2013; Dangelico and Pontrandolfo, 2015).

Environment protection and the improvement of organisational performance are two of the priorities for business and society, and the basis for attaining sustainable development (Cegarra-Navarro and Martinez-Martínez, 2010). Through actions to reduce their negative impact on the environment, organisations can -directly and indirectly, improve their business performance (Boiral, Raineri and Talbot, 2016; Kabongo and Boiral, 2017; Martínez-Martínez, Cegarra-Navarro and García-Pérez, 2015; Yeh, Ma and Huan, 2016). In the knowledge economy, where sustainable development becomes the mantra of the future (Waldimir et al., 2011), environmental knowledge and environmental learning help determine how the duality organisation–environment is managed (Sinclair, Diduck and Fitzpatrick, 2008; Martínez-Martínez et al., 2019).

Conscious of the challenges inherent to the use of natural resources, customers and other stakeholders of the hospitality industry often demand explicit measures for environmental protection. Commitment to environmental sustainability therefore becomes an imperative for the sector. Paradoxically, the sector has been only marginally affected by environmental regulations worldwide, thus becoming a widely neglected research setting. Thus, the tourism sector has the potential to help the research and practice communities understand the rationale behind the different ways organisations respond to environmental concerns (Boiral et al., 2016; Darnall, Henriques, and Sadorsky, 2010; Fraj, Matute, and Melero, 2015; Rahman and Reynolds, 2016).

The purpose of this study is therefore to analyse the role played by organisational learning over time as key driver for the processes related to the updating of the environmental knowledge stocks and flows within an organisation, along with the impact that these processes may have on business performance. This paper contributes to the relevant literature in several dimensions. Firstly, it analyses the relationships between environmental knowledge and performance in the context of the hospitality industry, unlike the majority of previous studies which have examined industrial settings (Molina-Azorín et al., 2009; Dangelico and Pontrandolfo, 2015). Secondly, this paper incorporates a longitudinal perspective, focusing on the changes of environmental knowledge mediated by organisational learning processes over a period of time (between 2008 and 2014), with the impact it had on business performance.

The proposed theoretical framework is presented in the following section. In section 3, the methodology section provides details of the empirical tool used to collect appropriate data to test the conceptual model presented in the theoretical framework. Finally, the theoretical contribution and managerial implications of this research are discussed in section 4.
2. The proposed research model

2.1. Environmental knowledge and the Spanish hospitality industry

This research proposes a theoretical model developed through analysis of quantitative data from the hospitality industry in Spain, particularly the section of the industry that deals with hotel operations and management.

Research has shown that the service sector contributes to more than 70% of the gross domestic product (GDP) in both developed and developing economies (Mittal and Dhar, 2016). As of the end of 2016, France, the United States, Spain and China, in this order, remain as the world’s top tourism destinations (WTO, 2017). These countries not only attract the highest numbers of tourists but also have a combined income of approximately US$ 400 billion per year derived from tourism. In spite of these statistics, however, the hospitality industry is still considered as a developing market (Baena, 2018).

Hotels carry out activities with a substantial reliance on the environment, an issue that has challenged the global competitive context where they operate (Alonso and Ogle, 2010). Increasingly, some customers are willing to pay more for a more environmentally responsible hotel (Tee et al., 2017). Thus, hotel managers have been required to reconsider the role that their organisations play in the conservation of natural resources. In addition, the emergence of ‘green tourism’ has challenged hotels to satisfy the increasing demands of tourists who remain concerned with the products and services offered by hoteliers. In this context, the implementation of an environmentally-friendly strategy could become a key success factor for the competitiveness of hotels (Chen and Peng, 2012; Stegerean, Petre and Chis, 2014). As a consequence, most organisations within the hospitality sector are faced with an increasingly complex and competitive business environment. Continuous learning and adaptation have therefore become an imperative, as it has the need to embrace innovation for survival and success (Cruz et al., 2016; Heisig et al., 2016; Zieba, Bolisani and Scarso, 2016; Horng et al., 2017).

According to Fryxell and Lo (2015), environmental knowledge is defined as a general knowledge of facts, concepts, and relationships concerning the natural environment and its major ecosystems. Wernick (2003) described environmental knowledge as a system that connects data, analysis and people and presents an opportunity to formalise developed ecology in a business environment. Thus, environmental knowledge involves what is common knowledge for society about the environment, key relationships leading to environmental aspects or impacts, and an appreciation of systems, and collective responsibilities necessary for sustainable development (Po-Shin and Li-Hsing, 2009; Whyte, 2013).

We have conducted an analytical review of the concept of environmental knowledge. Based upon this review, to best of our knowledge, the causal model shown in Figure 1 has never been tried before.

The concept of environmental knowledge has evolved significantly over the years. As shown in Table 1 environmental knowledge will often depend on the chosen point of view (e.g. managers, farmers, residents or visitors). Anyway, it involves facts, concepts, and relationships concerning the natural environment and its major ecosystems. Another point these definitions have in common is that environmental knowledge connects data, analysis and people and presents an opportunity to formalise...
developed ecology in a business environment. Bearing the above ideas in mind, this study defines environmental knowledge as to the continuous understanding and retention of information on ecological situations and problems.

Insert Table 1 about here

This research focuses on the study of how the updating of environmental knowledge, mediated by learning processes within the organisation, contributes to the development of new environmental-informed responses or to adapting existing environmental approaches to business management. The research is based on the premise that learning processes within organisations are formed through two distinct, yet complementary structures: the first phase is related to the exploration of new skills and knowledge-based processes, while the second stage aims to exploit the capacities and routines already available within the organisation (VanDeusen and Mueller, 1999). Crossan, Lane and White (1999) call these ‘feedforward’ and ‘feedback’ learning processes, respectively.

Thus, learning is understood to feed both forward namely from the individuals and the external stakeholders to the organisation (exploration of new knowledge) (Chan and Hsu, 2016), and backwards -that is, from knowledge learned to knowledge users (exploitation of knowledge) (Cegarra-Navarro, 2007). Creating environmental knowledge requires from hotels both the exploration of new possibilities for an early understanding of risks and opportunities, and exploitation of latest guidelines and environmental regulatory requirements for daily operations.

The argument on this paper is based on the views of organisational learning as the process whereby knowledge is created through the combination of explorative and exploitative activities (March, 1991; Bontis, Crossan and Hulland, 2002; Holmqvist, 2004; Mom, Van Den Bosch and Volberda, 2007; Mihalache and Mihalache, 2016). When both processes take place simultaneously, new knowledge is created as a result of the rearrangement of existing knowledge structures, the revision of previous knowledge structures, and the building and revision of theories (March, 1991; Bontis, Crossan and Hulland, 2002; Holmqvist, 2004; Mom, Van Den Bosch and Volberda, 2007).

2.2. The relationship between environmental knowledge and organisational learning over time

In the context of the hospitality sector, the term environmental knowledge has been used to characterise the way in which organisations are able to create a path for the implementation of environmental practices that promote sustainable development (Martínez-Martínez, Cegarra-Navarro and García-Pérez, 2015). In this paper, the authors adopt the same views to consider environmental knowledge as knowledge that helps hotel managers develop better environmental solutions. Environmental knowledge is held by both employees and management at individual and organisational levels. At the same time, they become stakeholders of such knowledge as they acquire and use environmental knowledge resources through socialisation and in delivering every aspect of the firm’s transformation process (Spender, 1998).
This use of environmental knowledge helps employees find solutions to problems and improve their performance (Easterby-Smith and Prieto, 2008; Boiral, Raineri and Talbot, 2016). Previous research has shown how by sharing and using the tacit environmental knowledge of stakeholders new knowledge structures can be created (Boiral, 2002). Likewise, the implementation of environmentally-friendly programs requires learning (Yang and Zhang, 2017), collaboration and supportive relationships between employees, which are facilitated by the presence of environmental knowledge in the firm (Paillé and Raineri, 2015). Thus, the first hypothesis was formulated as follows:

**H1. Environmental knowledge (t) positively influences organisational learning (t)**

The ability of an organisation to adapt to a changing environment requires a balance between the exploration and the exploitation of knowledge in order to attain long-term viability (Kim and Rhee, 2009). This research adds to such argument by proposing that success of an adaptive behaviour relies on an ongoing updating of the organisational learning processes. An up to date organisational learning strategy within the firm may therefore be seen as a driver for exploitation and exploration of environmental knowledge over time (Sinclair, Diduck and Fitzpatrick, 2008; Kim and Rhee, 2009; Liao, Chang and Wu, 2010; Kalmuk and Acar, 2015). As Martínez-Martínez, Cegarra-Navarro and Garcia-Perez (2015) have noted, “time” provides hospitality companies with the temporal space they need to modify and adjust to new environmental challenges in the same way that planning aims to enable recycling. This led the authors to hypothesise that:

**H2. Organisational learning (t) positively influences future environmental knowledge (t+6)**

Once staff have up to date knowledge concerning the environment (e.g. new regulations to improve integrity of tourism industry), this knowledge can be viewed as a source of improved solutions to meet new market needs or requirements (Sinclair, Diduck and Fitzpatrick, 2008; Kim and Rhee, 2009; Liao, Chang and Wu, 2010; Kalmuk and Acar, 2015). In other words, since environmental knowledge such as that of regulations and legislation often has a dynamic nature, it requires solutions to be regularly updated to enable managers to create (exploration), retain, transfer and use (exploitation) an organisation’s explicit and tacit environmental knowledge over time (Easterby-Smith and Prieto, 2008). In the same way, organisations need to develop dynamic capabilities -often understood as routinised knowledge, that target the development and adaptation of operating routines (Argote and Miron-Spektor, 2011; Leonidou et al., 2015; Kabongo and Boiral, 2017). This allows organisations to incorporate into their routines the measures dictated by changes in the environment (Boiral, Raineri and Talbot, 2016; Font, Garay and Jones, 2016).

Hotels operate in a framework of intensive innovation and therefore need to review those learning processes designed to create and update environmental knowledge (Martínez-Martínez, Cegarra-Navarro and Garcia-Pérez, 2015). For example, according to Psomas et al., (2010) and Tari, Claver-Cortés et al., (2010) a way to increase and update environmental knowledge is the implementation of quality standards such as ISO 9001, which suggests that hotels need to update their environmental knowledge through organisational learning over time (Fraj, Matute and Melero, 2015). Thus, longitudinal studies might potentially elucidate the
long-term effects of organisational learning on environmental knowledge. We therefore propose the following hypothesis:

**H3. Environmental learning (t+6) has positively effects on organisational learning (t+6)**

One of the most important drivers for the implementation of ‘green’ organisational learning strategies and initiatives is the views of the customer, often referred to as the key stakeholder in driving hotels to be environmentally friendly. Indeed, a growing consumer base are attracted by the ecological appeal of lodging facilities (Han, Hsu, Lee, & Sheu, 2011; Han & Chan, 2013; Huang & Liu, 2017).

So, in the case of these hotels, environmental protection activities are embedded in business operations and may bring some benefits to their operation (Hsiao, Chuang and Huang, 2018). These may include a reduction of operating costs by exploiting ecological efficiencies; an increased demand by attracting ‘green’ consumers (Bohdanowicz, 2006); gaining a competitive advantage; achieving marketing benefits and improved relationships with stakeholders; improving corporate reputation, obtaining additional social benefits; customer satisfaction, reducing long-term risks; innovation; and a higher ability to influence or to operate ahead of the formalisation of new regulations (Molina-Azorín et al., 2009; Cegarra-Navarro and Martinez-Martinez, 2010; Mina, Bascavusoglu-Moreau and Hughes, 2014; Dangelico and Pontrandolfo, 2015; Bhatnagar and Gopalaswamy, 2017; Tang and Lam, 2017; Yu, 2017).

The above considerations have led us to propose that hotel performance is likely to be associated with environmental knowledge. Through the development and implementation of organisational learning strategies it is possible to increase environmental knowledge, help hotels improve their business performance and obtain also a sources of competitive advantage (Easterby-Smith and Prieto, 2008; Uotila et al., 2009; Civre and Omerzel, 2015; Park and Kim, 2017). Thus, the following hypothesis is proposed:

**H4. The existence of an up-to-date organisational learning strategy (t+6) could help hotels achieve better levels of business performance.**

Based on the above, the path relationships between variables are hypothesised as shown in Figure 1. Such relationships can be briefly described as follows: hotels must exploit and explore new environmental knowledge in order to internalise such knowledge through updated learning processes and thereby improve their business performance.

**Insert Figure 1 about here**

### 3. Method

#### 3.1 Data collection

The population samplings used in this study comprised hotel tourist managers in Spain. There are several factors that make the Spanish tourist industry a interesting subject of study for the Spanish economy's recovery. 13% of the Spanish gross domestic product (GDP) and 11% of all employments are due to the Spanish tourist industry (World Travel and Tourism Council
2017). In addition, this is a mature industry with a high level of environmental commitment, allowing us to analyse aspects related to the existence of an up-to-date organisational learning strategy and levels of business performance. SABI database was used to establish a list of 560 hotels which had 10 or more employees in 2007.

In order to delimitate the activities that are inside of this sector, the National Classification of Economic Activities (CNAE-552) was used. From early September to the end of October 2008 we phoned and requested to participate in the work 560 hotels. This initial phase resulted in a total of 245 responses to the survey, 127 of which were considered to be valid. Six years later, between January and February 2014 the survey was repeated among companies belonging to the same sample and 87 valid responses were collected, representing a response rate of 15.53 per cent.

3.2 Measures

Using Churchill’s (1979) techniques, we developed a first draft of 16 items, which was refined and validated through a pilot study with three hotels.

Knowledge exploration (ER): In order to reflect the ER of the company adequately, we calculated the willingness to support new skills, creativity and experimentation (Mom, Van Den Bosch and Volberda, 2007).

Knowledge exploitation (ET): Following the recommendations of Bontis et al., (2002), four items were adapted as our measure for ET. These items represent firms’ capability to apply and operationalise knowledge and ‘feed-back learning flows’.

Environmental knowledge (EK): We have designed a four-item scale drawing on the ideas established by Martinez-Martínez et al., (2015). The items included are: the utilisation of organic products; the use of less polluting industrial processes and products; the implementation of a green program and environmental emergency plans.

Business performance (BP). In this study, BP is included as the dependent variable and it is operationalised by asking questions about growth rate of sales, growth rate of profits, profitability rate on total assets and productivity (Kaplan and Norton, 1992; Klassen and McLaughlin, 1996; March and Sutton, 1997).

3.3 Data analysis

The methodology used was structural equations with PLS (Partial Least Squares) in the SmartPLS program (Chin, 1998; Chin, 2003). In order to analyse the relationships between the different paths of the model, the evaluation of the measured model is required (Barclay, Higgins and Thompson, 1995). As shown in Table 2, the reliability of the measurement scales was verified with the Cronbach alpha coefficient, which returned a value greater than 0.7 in all cases. In addition, the mean extracted variance (AVE) ranged from 0.501 to 0.621 and revealed that all reflective constructs exceeded the 0.50 limit (Fornell and Larcker, 1981). The values for composite reliability are also greater than the stricter value of 0.8 (Nunnally, 1978). Intervals for discriminant scores also relate more strongly to its own measures than to others (see Table 2). In other words, the mean variance extracted for each construct is greater (Fornell and Larcker, 1981). Finally, the R2 value for the endogenous constructs ranged from 0.17 to 0.46 and exceeded the recommended minimum value of 0.1, which demonstrates that the model is suitable for testing the hypotheses (Figure 2).
The two reflective constructs used for measuring organisational learning (OL) do report that all first-order and second-order factor loadings were significant, which means that organisational learning (t) and organisational learning (t+6) can be operationalised by knowledge exploration and knowledge exploitation (see Table 3 and Table 4).

3.4 Results

This research uses PLS-Graph software version 3.00 to conduct an analysis of the data collected, due to, among other reasons, PLS is recommended for studies where there are fewer than 250 observations (Reinartz, Haenlein and Henseler, 2009). As Figure 2 shows, the results support of the relations hypothesized. The first hypothesis suggests a positive relationship between EK and OL ($\beta = 0.68, p < 0.01$). We also proposed that EK (t+6) mediates the relationship between OL (t) and OL (t+6). According to the findings, showed in Figure 2, there is a positive relationship between OL (t) and EK (t+6) ($\beta = 0.55, p < 0.01$) and EK (t+6) is positively related to ($\beta = 0.49, p < 0.01$). Finally, results also show a positive effect of EK (t+6) on BP (t+6) ($\beta = 0.41, p < 0.01$). Hence, the findings provided full support for all the relations hypothesized.

4. Discussion

The presence of environmental knowledge is a precondition for environmentally supportive action and a driver of positive managerial behaviours towards the environment by the hospitality sector. Given the dynamic nature of knowledge in general and environmental knowledge in particular, time as a construct becomes a key factor for the design and study of strategies to address environmental and sustainability challenges and for their adoption by the hospitality sector. However, despite the relevance of the time construct, its effects on the relationship between environmental knowledge, organisational learning and business performance in the context of the hospitality sector has not received enough attention in the extant literature. By focusing on such relationships this research has made a significant contribution to the framing of knowledge in theory and practice for areas such as knowledge management and sustainable hospitality management.

This research has extended the existing theories on the learning organisation by operationalising the concept of organisational learning through explorative and exploitative processes in the hospitality domain. Our results suggest that when studied over a period of time, organisational learning is a multifaceted construct that fits into explorative and exploitative processes. This finding corroborates the fact that hotel managers are expected to put a relatively similar emphasis on both explorative and exploitative processes, which are
known to bring a significant number of benefits to learning organisations (March, 1991; Bontis, Crossan and Hulland, 2002; Holmqvist, 2004; Mom, Van Den Bosch and Volberda, 2007; Tang and Lam, 2017; Yu, 2017).

Another set of contributions derived from the empirical testing of the proposed hypotheses is implicitly represented in the model in Figure 1. The identified relationships between the variables in the model contribute to a better understanding of the theoretical and managerial implications of the research, which are further described in the remainder of this section.

4.1 Structural model

Regarding Hypothesis H1, the results suggest that some prior environmental knowledge is necessary for the success of the firm’s efforts to understand and implement learning processes that keep hotel employees engaged and motivated to learn about the subject and its implications. These results confirm that when the existing environmental knowledge is considered by organisational learning strategies, employees are enabled to obtain a more complete understanding of environmental issues and therefore contribute to innovative products and services (Boiral et al., 2016; Easterby-Smith and Prieto, 2008). As many scholars have suggested prior knowledge prepares the ground for organisational learning, converting environmental knowledge into new knowledge structures or processes to support innovation (Newey and Zahra, 2009; Mariano and Walter, 2015).

With respect to Hypothesis H2, the results show that there is a positive relationship between organisational learning at a specified time ($t$) and environmental knowledge at a later point in time (after a period of 6 years as investigated by this research). A possible explanation for these findings may relate to the fact that hotels -as most organisations, need time to acquire and adopt new knowledge (Crossan, Cunha, Vera, & Cunha, 2005). Therefore, this dynamic relationship is essential for the translation of new environmental learning programs into future actions (Liao et al., 2010; Kalmuk and Acar, 2015). This highlights that hotel managers should not expect to see immediate outcomes from daily explorative and exploitative activities related to environmental issues. In the same way that our brain needs time to digest all the information we are given, lack of familiarity often produces fear and anxiety which in turn undermines the creation of new environmental knowledge. Therefore, hotel managers must be patient and consistent in their environmental learning strategy, and for this they need time.

Regarding the Hypothesis H3, and in line with the hypothesis H1, the results of the analysis show a significant relationship between future ($t+6$) organisational learning and future ($t+6$) environmental knowledge. This means that since much of the knowledge acquired from explorative and exploitative processes at a given time ($t$) is of an individual nature, it is necessary to drive its conversion into social knowledge at a later point in period of six years before feeding it back onto the learning process. Otherwise, people in the organisation will spend considerable time and effort on applying new environmental routines and procedures with no results guaranteed.

Regarding the Hypothesis H4, the results suggest that a hotel’s organisational learning strategy may have a positive impact on its performance. This is in broad agreement with the
conclusions of authors such as Martínez-Martínez et al., (2015) who drawing upon a reading of Boiral (2002) propose that the use of environmental knowledge involves changes in the organisational knowledge structures, which in turn helps individuals to develop new environmental skills and competencies. One of the most important rules of management states that those routines which are not known are not followed. Hence, the best way to operationalise environmentally friendly programs and improve organisational performance is by operationalising organisational learning (Bohdanowicz, 2005).

It is in the light of these considerations that a number of implications for management have emerged from this research. New mechanisms are required by hotels to raise awareness of relevant environmental issues in the specific context where they operate. The implementation of environmentally responsible activities and of new and revised policies influencing both operational and management strategies could lead to the long-term sustainability of their businesses.

Finally, hotels management must understand that environmentally responsible activities, policies and strategies must be sustainable so that related performance improvements are also tenable. That is, hotels need mechanisms for a continuous acquisition and use of environmental knowledge in order to achieve a sustained positive effect on both performance and the environment. In other words, our findings suggest that managers need to shift their mindsets towards organisational capabilities such as environmental learning within hotels. This research has highlighted that continuous environmental learning is an imperative in the current dynamic and competitive landscape where the tourism sector operates.

5. Conclusion, implications, limitations and future research

With the emergence of more rigid and strict environmental regulations, hotels have had to work quickly to adapt their products, services and processes to the changing needs of their stakeholders. In most cases the learning processes have a practical objective, namely the implementation of environmental regulations and the control of access to natural resources. Through a longitudinal study consisting of two distinct learning phases in 2008 and 2014, this study shows how the presence of learning processes impact on environmental performance. The research focused on the challenges of sustainability and environmental performance, and their relationship with business performance. Elements that are key in turning the adoption of sustainable development practices into a competitive advantage were highlighted.

Findings show that processes of exploration and exploitation of environmental knowledge result in an increased organisational learning which in turn have a positive effect on the initiatives for the protection of the environment. The proposed combination of organisational learning and exploration and exploitation of environmental knowledge foster innovations in the way the hospitality industry protects the environment, leading to benefits not only for business but also for society.

From a theoretical standpoint, the research has uncovered the direct relationship that exists between organisational learning and environmental knowledge over time (a period of six years in this case) in the hospitality sector, a link that is supported by environmental knowledge that
was already available in the organisation. Whilst this relationship had been studied in other, mainly industry settings (Boiral, 2002; Boiral, Cayer, and Baron, 2009), this research fills a gap in this domain for the context of service-related organisations, particularly relevant for hotel managers and their international supply chains. Additionally, a longitudinal perspective provides an improved perspective when compared to most previous studies.

From the practical perspective, first, this research has shown that stakeholders within the hospitality industry can seek to improve performance through a balanced model of exploration and exploitation of environmental knowledge. In others words, as environmental issues become increasingly severe, the engagement of managers and other stakeholders in organisational learning strategies becomes an imperative. This study also guides managers on strategies to apply in their business. Results show that it is necessary to provide for sufficient time for the adaptation of any conflicting environmental provisions in existing legislation. This means that managers should allow sufficient time for learning and planning. Therefore, the art of creating value from an organization’s environmental knowledge is a long-term policy and cannot be expected to deliver immediate results, but a series of learning processes can help managers understand the benefits of identifying what matters and keeping focus to have sustainable environmental knowledge for their employees and their organizations.

A second practical implication is directly evidenced by our results, hotels with environmental learning practices can improve their business performance, this result can to motivate to the managers to take care of the environment precisely because these actions will benefit them. The profits can be produced in two different ways, on the one hand, improved the sales and the other hand, to reduce the cost associate to their services (eg. if their worker have more environmental knowledge can choose better their actions on environment and optimize the cost that can imply its environmental unknowledge).

A third practical implication is directly related with the strategy that managers can decide to implement, Will they use this result as a marketing strategy or can they use it in their strategic direction? In both cases the environment can be benefited, it would be interesting to study in the future the motivations that managers have to incorporate into their hotel management strategy. In addition to what kind of strategy are they implementing, management and / or marketing.

A fourth practical implication is from the perspective of corporate social responsibility, this research is focus on how the hotels which have an environmental knowledge practices can improve their performance, specifically business performance but the hotels with practices and eco-friendly image could also increase their social performance. As is known, environmental aspects are one of the pillars of corporate social responsibility. Stakeholders can perceive better the hotels that take care of the environment compared to those that do not have environmental care practices and this is reflected in their social performance (eg. reputation or perceived image). In this sense, enabling different stakeholders to share their goals and interactions will help make the environmental issues of what should be done to bring about the most desired consequences through the shared planning process clear. This
practical implication could be a future line of research because it is necessary to measure the impact of environmental knowledge on social performance.

A fifth practical implication is that hotels’ managers can introduce in their management and their decision making policies for the training of workers focused on acquiring, updating and renewing environmental knowledge, in this aspect, managers could assess the level of obsolete knowledge that their workers have, according to the current regulations. Managers may also consider implementing or maintaining some specific environmental regulation such as ISO 14000. Ours research shows that update organizational learning is need in hotels, a good way to improve the environmental knowledge in organization and worker could be creating communities of practices, introducing prizes to the best applied environmental ideas, fostering spaces for the freedom of environmental proposals or monitoring the actions carried out by the competition. Finally, it seems logical to point out that in the process of learning environmental knowledge, knowledge agents are a key aspect to consider.

As in other studies, there are limitations in the findings of the research. This study focuses on the Spanish hospitality industry and -specifically, in Spanish hotels. In order to corroborate the generalisability of our findings to other service-related industries, similar analyses would need to include other organisations within the hospitality industry, other sectors which have an impact on the environment, and even organisations and sectors in different geographic and socio-economic contexts. This would also allow for an improved empirical understanding of this highly relevant subject. Finally, we sought responses to the survey from only one manager within each hotel involved in the research. This suggests the need for future research to widen the spectrum to capture the views from more than one stakeholder (e.g. employees, chain operators, tour operators or customers) within each hotel involved. Future studies may also be able to use a more varied range of sources for data collection which not only include hotels but also other parts of the hospitality industry. Including other countries in this analysis could also be beneficial for the purpose of further developing this domain.

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Appendix: Questionnaire items

Knowledge Exploration: Indicate the extent to which each of the agents indicated below has capacity to influence on the hotel’s environmental performance (0= no capacity and 10= high capacity):

KEr_1: Your company cares about collecting information about the most important groups
KEr_2: Your company supports the exchange of ideas and formal dialogues (e.g., meetings)
KEr_3: Your company has manuals and documents on customer service procedures
KEr_4: We emphasize the search and sharing of new values and thoughts

Knowledge Exploitation: Indicate the extent to which each of the agents indicated below has capacity to influence on the hotel’s environmental performance (0= no capacity and 10= high capacity):

KEt_1: When our customers want us to modify a product or service, we make efforts to modify it.
KEt_2: Your company rewards the creativity of employees
KEt_3: Your company supports the use of metaphors to resolve employee doubts
KEt_4: Your company shares information with the most important collectives of the question

Environmental knowledge (0= high disagreement and 10= high agreement):

EK_1: Priority is being given to organic products (biodegradable, recyclable, etc.).
EK_2: The company (hotel) uses less polluting industrial processes and products.
EK_3: The company (hotel) has developed a green program (waste management, control of effluents, inventory of pollution sources).
EK_4: The company (hotel) has developed a drafting of environmental emergency plans and measures.

Business Performance (0=much worse than competitors and 10=much better than competitors):

BP_1: Growth rate of sales
BP_2: Growth rate of profits
BP_3: Profitability rate on total assets
BP_4: Greater productivity
### Table 1. Key definitions of environmental knowledge

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Source: own elaboration
Figure 1: Theoretical Model
Table 2: Construct correlation matrix

|                                 | Mean | SD  | CR  | AVE | 1   | 2   | 3   | 4   | 5   | 6   | 7   | 8   | 9   |
|---------------------------------|------|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|-----|
| 1. Environmental knowledge (t)  | 6.91 | 1.72| 0.79| 0.50| 0.71|    |    |    |    |    |    |    |    |    |
| 2. Knowledge Exploration (t)    | 7.01 | 1.67| 0.87| 0.62| 0.65| 0.79|    |    |    |    |    |    |    |    |
| 3. Knowledge Exploitation (t)   | 6.56 | 1.81| 0.84| 0.57| 0.55| 0.61| 0.75|    |    |    |    |    |    |    |
| 4. Organisational Learning (t) | 6.78 | 1.57| n.a.| n.a.| 0.67| 0.78| 0.71| n.a.|    |    |    |    |    |    |
| 5. Environmental knowledge (t+6)| 6.86 | 1.74| 0.64| 0.50| 0.70| 0.61| 0.70| 0.62| 0.71|    |    |    |    |    |
| 6. Knowledge Exploration (t+6) | 6.84 | 1.72| 0.79| 0.60| 0.60| 0.75| 0.63| 0.85| 0.63| 0.77|    |    |    |    |
| 7. Knowledge Exploitation (t+6) | 6.49 | 1.92| 0.74| 0.52| 0.51| 0.57| 0.71| 0.71| 0.57| 0.68| 0.72|    |    |    |
| 8. Organisational Learning (t+6)| 6.67 | 1.67| n.a.| n.a.| 0.63| 0.77| 0.73| 0.93| 0.68| 0.71| 0.71| n.a.|    |    |
| 9. Business Performance (t+6)   | 5.82 | 1.87| 0.89| 0.51| 0.53| 0.37| 0.36| 0.41| 0.60| 0.37| 0.38| 0.42| 0.71|    |

Notes:
Mean = the average score for all of the items included in this measure; S.D. = Standard Deviation; CR = Composite Reliability; AVE = Average Variance Extracted. The bold numbers on the diagonal are the square root of the Average Variance Extracted. Off-diagonal elements are correlations among construct.
### Table 3. Second-order confirmatory factor analysis of Organisational Learning (t)

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<th>First-order construct</th>
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<tr>
<td></td>
<td>KEr_2</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>KEr_3</td>
<td>0.80&lt;sup&gt;a&lt;/sup&gt;</td>
<td></td>
<td></td>
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<tr>
<td></td>
<td>KEr_4</td>
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Note: <sup>a</sup><sub>0.01</sub> [based on t(4999), two-tailed test]; t(0.01, 4999) = 2.577; Year 2008
Table 4. Second-order confirmatory factor analysis of Organisational Learning (t+6)

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Figure 2. Structural equation model

Notes:
Notes: *<0.01 [based on t (4999), two-tailed test]; t (0.01, 4999) = 2.577]
23 November 2018

Dear Dr Janney,

Thank you for the thoughtful reviews on our manuscript (MRR-02-2018-0091), entitled “Environmental knowledge strategy: driving success of the hospitality industry”. We would also like to thank the reviewers for their insightful comments. You have greatly helped reshape this into a much better paper.

We have conducted a thorough revision of the manuscript and considered the feedback received. Changes made are summarised below and have also been highlighted within the document by using a different font colour (blue).

Thank you for considering the revised version of our manuscript. We look forward to hearing from you in due course.

Yours sincerely,

The authors
Response to editor and reviewers

Friday, November 23, 2018

Dear Reviewer,

Thank you for your constructive and helpful review. We were pleased that you found our topic interesting. We appreciate the time you put into the review and believe your comments have significantly contributed to making this a better manuscript. We will summarise or paraphrase your feedback, shown in italics below, and provide our responses. We will indent our responses, as we have in this paragraph, and also itemise the responses whenever possible.

Content:

#2: Relationship to Literature: Does the paper demonstrate an adequate understanding of the relevant literature in the field and cite an appropriate range of literature sources? Is any significant work ignored?: I saw little changes in the literature review. Still need an analytical review not just a summation.

We have conducted an analytical review of the concept of environmental knowledge. Based upon this review, to best of our knowledge, the causal model shown in Figure has never been tried before.

The concept of environmental knowledge has evolved significantly over the years. As shown in Table 1 environmental knowledge will often depend on the chosen point of view (e.g. managers, farmers, residents or visitors). Anyway, it involves facts, concepts, and relationships concerning the natural environment and its major ecosystems. Another point these definitions have in common is that environmental knowledge connects data, analysis and people and presents an opportunity to formalise developed ecology in a business environment. Bearing the above ideas in mind, this study defines environmental knowledge as to the continuous understanding and retention of information on ecological situations and problems.
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Source: own elaboration
We are pleased that you have noticed the changes we have made and following its recommendation we have explained four possible practical implications to improve the conclusions of this research. As follows:

(...)A second practical implication is directly evidenced by our results, hotels with environmental learning practices can improve their business performance, this result can to motivate to the managers to take care of the environment precisely because these actions will benefit them. The profits can be produced in two different ways, on the one hand, improved the sales and the other hand, to reduce the cost associate to their services (eg. if their worker have more environmental knowledge can choose better their actions on environment and optimize the cost that can imply its environmental unknowledge).

A third practical implication is directly related with the strategy that managers can decide to implement, Will they use this result as a marketing strategy or can they use it in their strategic direction? In both cases the environment can be benefited, it would be interesting to study in the future the motivations that managers have to incorporate into their hotel management strategy. In addition to what kind of strategy are they implementing, management and / or marketing.

A fourth practical implication is from the perspective of corporate social responsibility, this research is focus on how the hotels which have an environmental knowledge practices can improve their performance, specifically business performance but the hotels with practices and eco-friendly image could also increase their social performance. As is known, environmental aspects are one of the pillars of corporate social responsibility. Stakeholders can perceive better the hotels that take care of the environment compared to those that do not have environmental care practices and this is reflected in their social performance (eg. reputation or perceived image). In this sense, enabling different stakeholders to share their goals and interactions will help make the environmental issues of what should be done to bring about the most desired consequences through the shared planning process clear. This practical implication could be a future line of research because it is necessary to measure the impact of environmental knowledge on social performance.

A fifth practical implication is that hotels’ managers can introduce in their management and their decision making policies for the training of workers focused on acquiring, updating and renewing environmental knowledge, in this aspect, managers could assess the level of obsolete knowledge that their workers have, according to the current
regulations. Managers may also consider implementing or maintaining some specific environmental regulation such as ISO 14000. Our research shows that updating organizational learning is needed in hotels, a good way to improve the environmental knowledge in organizations and workers could be creating communities of practices, introducing prizes to the best applied environmental ideas, fostering spaces for the freedom of environmental proposals or monitoring the actions carried out by the competition. Finally, it seems logical to point out that in the process of learning environmental knowledge, knowledge agents are a key aspect to consider.
References


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