

# **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 Martínez-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; Stegorean, 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

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3 developed ecology in a business environment. Bearing the above ideas in mind, this study defines  
4 environmental knowledge as to the continuous understanding and retention of information on  
5 ecological situations and problems.  
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7 *Insert Table 1 about here*  
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10 This research focuses on the study of how the updating of environmental knowledge, mediated  
11 by learning processes within the organisation, contributes to the development of new  
12 environmental-informed responses or to adapting existing environmental approaches to  
13 business management. The research is based on the premise that learning processes within  
14 organisations are formed through two distinct, yet complementary structures: the first phase is  
15 related to the exploration of new skills and knowledge-based processes, while the second stage  
16 aims to exploit the capacities and routines already available within the organisation  
17 (VanDeusen and Mueller, 1999). Crossan, Lane and White (1999) call these 'feedforward'  
18 and 'feedback' learning processes, respectively.  
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22 Thus, learning is understood to feed both forward namely from the individuals and the external  
23 stakeholders to the organisation (exploration of new knowledge) (Chan and Hsu, 2016), and  
24 backwards -that is, from knowledge learned to knowledge users (exploitation of knowledge)  
25 (Cegarra-Navarro, 2007). Creating environmental knowledge requires from hotels both the  
26 exploration of new possibilities for an early understanding of risks and opportunities, and  
27 exploitation of latest guidelines and environmental regulatory requirements for daily  
28 operations.  
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32 The argument on this paper is based on the views of organisational learning as the process  
33 whereby knowledge is created through the combination of explorative and exploitative  
34 activities (March, 1991; Bontis, Crossan and Hulland, 2002; Holmqvist, 2004; Mom, Van Den  
35 Bosch and Volberda, 2007; Mihalache and Mihalache, 2016). When both processes take place  
36 simultaneously, new knowledge is created as a result of the rearrangement of existing  
37 knowledge structures, the revision of previous knowledge structures, and the building and  
38 revision of theories (March, 1991; Bontis, Crossan and Hulland, 2002; Holmqvist, 2004; Mom,  
39 Van Den Bosch and Volberda, 2007).  
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## 44 2.2. The relationship between environmental knowledge and organisational learning over time

45 In the context of the hospitality sector, the term environmental knowledge has been used to  
46 characterise the way in which organisations are able to create a path for the implementation of  
47 environmental practices that promote sustainable development (Martínez-Martínez, Cegarra-  
48 Navarro and García-Pérez, 2015). In this paper, the authors adopt the same views to consider  
49 environmental knowledge as knowledge that helps hotel managers develop better  
50 environmental solutions. Environmental knowledge is held by both employees and  
51 management at individual and organisational levels. At the same time, they become  
52 stakeholders of such knowledge as they acquire and use environmental knowledge resources  
53 through socialisation and in delivering every aspect of the firm's transformation process  
54 (Spender, 1998).  
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3 This use of environmental knowledge helps employees find solutions to problems and improve  
4 their performance (Easterby-Smith and Prieto, 2008; Boiral, Raineri and Talbot, 2016).  
5 Previous research has shown how by sharing and using the tacit environmental knowledge of  
6 stakeholders new knowledge structures can be created (Boiral, 2002). Likewise, the  
7 implementation of environmentally-friendly programs requires learning (Yang and Zhang,  
8 2017), collaboration and supportive relationships between employees, which are facilitated by  
9 the presence of environmental knowledge in the firm (Paillé and Raineri, 2015). Thus, the first  
10 hypothesis was formulated as follows:  
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15 *H1. Environmental knowledge (t) positively influences organisational learning (t)*

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17 The ability of an organisation to adapt to a changing environment requires a balance between  
18 the exploration and the exploitation of knowledge in order to attain long-term viability (Kim  
19 and Rhee, 2009). This research adds to such argument by proposing that success of an adaptive  
20 behaviour relies on an ongoing updating of the organisational learning processes. An up to date  
21 organisational learning strategy within the firm may therefore be seen as a driver for  
22 exploitation and exploration of environmental knowledge over time (Sinclair, Diduck and  
23 Fitzpatrick, 2008; Kim and Rhee, 2009; Liao, Chang and Wu, 2010; Kalmuk and Acar, 2015).  
24 As Martínez-Martínez, Cegarra-Navarro and García-Pérez (2015) have noted, “time” provides  
25 hospitality companies with the temporal space they need to modify and adjust to new  
26 environmental challenges in the same way that planning aims to enable recycling. This led the  
27 authors to hypothesise that:  
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33 *H2. Organisational learning (t) positively influences future environmental knowledge (t+6)*

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35 Once staff have up to date knowledge concerning the environment (e.g. new regulations to  
36 improve integrity of tourism industry), this knowledge can be viewed as a source of improved  
37 solutions to meet new market needs or requirements (Sinclair, Diduck and Fitzpatrick, 2008;  
38 Kim and Rhee, 2009; Liao, Chang and Wu, 2010; Kalmuk and Acar, 2015). In other words,  
39 since environmental knowledge such as that of regulations and legislation often has a dynamic  
40 nature, it requires solutions to be regularly updated to enable managers to create (exploration),  
41 retain, transfer and use (exploitation) an organisation’s explicit and tacit environmental  
42 knowledge over time (Easterby-Smith and Prieto, 2008). In the same way, organisations need  
43 to develop dynamic capabilities -often understood as routinised knowledge, that target the  
44 development and adaptation of operating routines (Argote and Miron-Spektor, 2011; Leonidou  
45 *et al.*, 2015; Kabongo and Boiral, 2017). This allows organisations to incorporate into their  
46 routines the measures dictated by changes in the environment (Boiral, Raineri and Talbot,  
47 2016; Font, Garay and Jones, 2016).  
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53 Hotels operate in a framework of intensive innovation and therefore need to review those  
54 learning processes designed to create and update environmental knowledge (Martínez-  
55 Martínez, Cegarra-Navarro and García-Pérez, 2015). For example, according to Psomas *et al.*,  
56 (2010) and Tarí, Claver-Cortés *et al.*, (2010) a way to increase and update environmental  
57 knowledge is the implementation of quality standards such as ISO 9001, which suggests that  
58 hotels need to update their environmental knowledge through organisational learning over time  
59 (Fraj, Matute and Melero, 2015). Thus, longitudinal studies might potentially elucidate the  
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3 long-term effects of organisational learning on environmental knowledge. We therefore  
4 propose the following hypothesis:  
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6 H3. Environmental learning (t+6) has positively effects on organisational learning (t+6)  
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9 One of the most important drivers for the implementation of 'green' organisational learning  
10 strategies and initiatives is the views of the customer, often referred to as the key stakeholder  
11 in driving hotels to be environmentally friendly. Indeed, a growing consumer base are attracted  
12 by the ecological appeal of lodging facilities (Han, Hsu, Lee, & Sheu, 2011; Han & Chan,  
13 2013; Huang & Liu, 2017).  
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16 So, in the case of these hotels, environmental protection activities are embedded in business  
17 operations and may bring some benefits to their operation (Hsiao, Chuang and Huang, 2018).  
18 These may include a reduction of operating costs by exploiting ecological efficiencies; an  
19 increased demand by attracting 'green' consumers (Bohdanowicz, 2006); gaining a  
20 competitive advantage; achieving marketing benefits and improved relationships with  
21 stakeholders; improving corporate reputation, obtaining additional social benefits; customer  
22 satisfaction, reducing long-term risks; innovation; and a higher ability to influence or to  
23 operate ahead of the formalisation of new regulations (Molina-Azorín *et al.*, 2009; Cegarra-  
24 Navarro and Martinez-Martínez, 2010; Mina, Bascavusoglu-Moreau and Hughes, 2014;  
25 Dangelico and Pontrandolfo, 2015; Bhatnagar and Gopalaswamy, 2017; Tang and Lam, 2017;  
26 Yu, 2017).  
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32 The above considerations have led us to propose that hotel performance is likely to be  
33 associated with environmental knowledge. Through the development and implementation of  
34 organisational learning strategies it is possible to increase environmental knowledge, help  
35 hotels improve their business performance and obtain also a sources of competitive advantage  
36 (Easterby-Smith and Prieto, 2008; Uotila *et al.*, 2009; Civre and Omerzel, 2015; Park and Kim,  
37 2017). Thus, the following hypothesis is proposed:  
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40 *H4. The existence of an up-to-date organisational learning strategy (t+6) could help hotels*  
41 *achieve better levels of business performance.*  
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44 Based on the above, the path relationships between variables are hypothesised as shown in  
45 Figure 1. Such relationships can be briefly described as follows: hotels must exploit and  
46 explore new environmental knowledge in order to internalise such knowledge through updated  
47 learning processes and thereby improve their business performance.  
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50 *Insert Figure 1 about here*  
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### 52 **3. Method**

#### 53 **3.1 Data collection**

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55 The population samplings used in this study comprised hotel tourist managers in Spain. There  
56 are several factors that make the Spanish tourist industry a interesting subject of study for the  
57 Spanish economy's recovery. 13% of the Spanish gross domestic product (GDP) and 11% of  
58 all employments are due to the Spanish tourist industry (World Travel and Tourism Council  
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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 Martínez-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 R<sup>2</sup> 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).

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*Insert Tabla 2 about here*

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).

*Insert Table 3 about here*

*Inset Table 4 about here*

### 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 BP (t+6) ( $\beta = 0.49$ ,  $p < 0.01$ ). 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.

*Insert Figure 2 about here*

### 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 exploitive processes, which are

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3 known to bring a significant number of benefits to learning organisations (March, 1991;  
4 Bontis, Crossan and Hulland, 2002; Holmqvist, 2004; Mom, Van Den Bosch and Volberda,  
5 2007; Tang and Lam, 2017; Yu, 2017).  
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8 Another set of contributions derived from the empirical testing of the proposed hypotheses is  
9 implicitly represented in the model in Figure 1. The identified relationships between the  
10 variables in the model contribute to a better understanding of the theoretical and managerial  
11 implications of the research, which are further described in the remainder of this section.  
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#### 13 14 4.1 Structural model 15

16 Regarding Hypothesis H1, the results suggest that some prior environmental knowledge is  
17 necessary for the success of the firm's efforts to understand and implement learning processes  
18 that keep hotel employees engaged and motivated to learn about the subject and its  
19 implications. These results confirm that when the existing environmental knowledge is  
20 considered by organisational learning strategies, employees are enabled to obtain a more  
21 complete understanding of environmental issues and therefore contribute to innovative  
22 products and services (Boiral et al., 2016; Easterby-Smith and Prieto, 2008). As many scholars  
23 have suggested prior knowledge prepares the ground for organisational learning, converting  
24 environmental knowledge into new knowledge structures or processes to support innovation  
25 (Newey and Zahra, 2009; Mariano and Walter, 2015).  
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30 With respect to Hypothesis H2, the results show that there is a positive relationship between  
31 organisational learning at a specified time ( $t$ ) and environmental knowledge at a later point in  
32 time (after a period of 6 years as investigated by this research). A possible explanation for  
33 these findings may relate to the fact that hotels -as most organisations, need time to acquire  
34 and adopt new knowledge (Crossan, Cunha, Vera, & Cunha, 2005). Therefore, this dynamic  
35 relationship is essential for the translation of new environmental learning programs into future  
36 actions (Liao et al., 2010; Kalmuk and Acar, 2015). This highlights that hotel managers should  
37 not expect to see immediate outcomes from daily explorative and exploitative activities  
38 related to environmental issues. In the same way that our brain needs time to digest all the  
39 information we are given, lack of familiarity often produces fear and anxiety which in turn  
40 undermines the creation of new environmental knowledge. Therefore, hotel managers must be  
41 patient and consistent in their environmental learning strategy, and for this they need time.  
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47 Regarding the Hypothesis H3, and in line with the hypothesis H1, the results of the analysis  
48 show a significant relationship between future ( $t+6$ ) organisational learning and future ( $t+6$ )  
49 environmental knowledge. This means that since much of the knowledge acquired from  
50 explorative and exploitative processes at a given time ( $t$ ) is of an individual nature, it is  
51 necessary to drive its conversion into social knowledge at a later point in period of six years  
52 before feeding it back onto the learning process. Otherwise, people in the organisation will  
53 spend considerable time and effort on applying new environmental routines and procedures  
54 with no results guaranteed.  
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58 Regarding the Hypothesis H4, the results suggest that a hotel's organisational learning  
59 strategy may have a positive impact on its performance. This is in broad agreement with the  
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3 conclusions of authors such as Martínez-Martínez et al., (2015) who drawing upon a reading of  
4 Boiral (2002) propose that the use of environmental knowledge involves changes in the  
5 organisational knowledge structures, which in turn helps individuals to develop new  
6 environmental skills and competencies. One of the most important rules of management states  
7 that those routines which are not known are not followed. Hence, the best way to  
8 operationalise environmentally friendly programs and improve organisational performance is  
9 by operationalising organisational learning (Bohdanowicz, 2005).

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

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

### 30 31 32 33 **5. Conclusion, implications, limitations and future research**

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

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

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57 From a theoretical standpoint, the research has uncovered the direct relationship that exists  
58 between organisational learning and environmental knowledge over time (a period of six years  
59 in this case) in the hospitality sector, a link that is supported by environmental knowledge that  
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3 was already available in the organisation. Whilst this relationship had been studied in other,  
4 mainly industry settings (Boiral, 2002; Boiral, Cayer, and Baron, 2009), this research fills a  
5 gap in this domain for the context of service-related organisations, particularly relevant for  
6 hotel managers and their international supply chains. Additionally, a longitudinal perspective  
7 provides an improved perspective when compared to most previous studies.  
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10 From the practical perspective, *first*, this research has shown that stakeholders within the  
11 hospitality industry can seek to improve performance through a balanced model of  
12 exploration and exploitation of environmental knowledge. In others words, as environmental  
13 issues become increasingly severe, the engagement of managers and other stakehorlders in  
14 organisational learning strategies becomes an imperative. This study also guides managers on  
15 strategies to apply in their business. Results show that it is necessary to provide for sufficient  
16 time for the adaptation of any conflicting environmental provisions in existing legislation.  
17 This means that managers should allow sufficient time for learning and planning. Therefore,  
18 the art of creating value from an organization's environmental knowledge is a long-term  
19 policy and cannot be expected to deliver immediate results, but a series of learning processes  
20 can help managers understand the benefits of identifying what matters and keeping focus to  
21 have sustainable environmental knowledge for their employees and their organizations.  
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27 A second practical implication is directly evidenced by our results, hotels with environmental  
28 learning practices can improve their business performance, this result can to motivate to the  
29 managers to take care of the environment precisely because these actions will benefit them.  
30 The profits can be produced in two different ways, on the one hand, improved the sales and  
31 the other hand, to reduce the cost associate to their services (eg. if their worker have more  
32 environmental knowledge can choose better their actions on environment and optimize the  
33 cost that can imply its environmental unknowledge).  
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37 A third practical implication is directly related with the strategy that managers can decide to  
38 implement, Will they use this result as a marketing strategy or can they use it in their strategic  
39 direction? In both cases the environment can be benefited, it would be interesting to study in  
40 the future the motivations that managers have to incorporate into their hotel management  
41 strategy. In addition to what kind of strategy are they implementing, management and / or  
42 marketing.  
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46 A fourth practical implication is from the perspective of corporate social responsibility, this  
47 research is focus on how the hotels which have an environmental knowledge practices can  
48 improve their performance, specifically business performance but the hotels with practices  
49 and eco-friendly image could also increase their social performance. As is known,  
50 environmental aspects are one of the pillars of corporate social responsibility. Stakeholders  
51 can perceive better the hotels that take care of the environment compared to those that do not  
52 have environmental care practices and this is reflected in their social performance (eg.  
53 reputation or perceived image). In this sense, enabling different stakeholders to share their  
54 goals and interactions will help make the environmental issues of what should be done to  
55 bring about the most desired consequences through the shared planning process clear. This  
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3 practical implication could be a future line of research because it is necessary to measure the  
4 impact of environmental knowledge on social performance.  
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7 A fifth practical implication is that hotels' managers can introduce in their management and  
8 their decision making policies for the training of workers focused on acquiring, updating and  
9 renewing environmental knowledge, in this aspect, managers could assess the level of  
10 obsolete knowledge that their workers have, according to the current regulations. Managers  
11 may also consider implementing or maintaining some specific environmental regulation such  
12 as ISO 14000. Ours research shows that update organizational learning is need in hotels, a  
13 good way to improve the environmental knowledge in organization and worker could be  
14 creating communities of practices, introducing prizes to the best applied environmental ideas,  
15 fostering spaces for the freedom of environmental proposals or monitoring the actions carried  
16 out by the competition. Finally, it seems logical to point out that in the process of learning  
17 environmental knowledge; knowledge agents are a key aspect to consider.  
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22 As in other studies, there are limitations in the findings of the research. This study focuses on  
23 the Spanish hospitality industry and -specifically, in Spanish hotels. In order to corroborate  
24 the generalisability of our findings to other service-related industries, similar analyses would  
25 need to include other organisations within the hospitality industry, other sectors which have  
26 an impact on the environment, and even organisations and sectors in different geographic and  
27 socio-economic contexts. This would also allow for an improved empirical understanding of  
28 this highly relevant subject. Finally, we sought responses to the survey from only one  
29 manager within each hotel involved in the research. This suggests the need for future research  
30 to widen the spectrum to capture the views from more than one stakeholder (e.g. employees,  
31 chain operators, tour operators or customers) within each hotel involved. Future studies may  
32 also be able to use a more varied range of sources for data collection which not only include  
33 hotels but also other parts of the hospitality industry. Including other countries in this analysis  
34 could also be beneficial for the purpose of further developing this domain.  
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## Appendix: Questionnaire items

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**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):**

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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 (for example 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

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**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):**

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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

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

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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.

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

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BP\_1: Growth rate of sales

BP\_2: Growth rate of profits

BP\_3: Profitability rate on total assets

BP\_4: Greater productivity

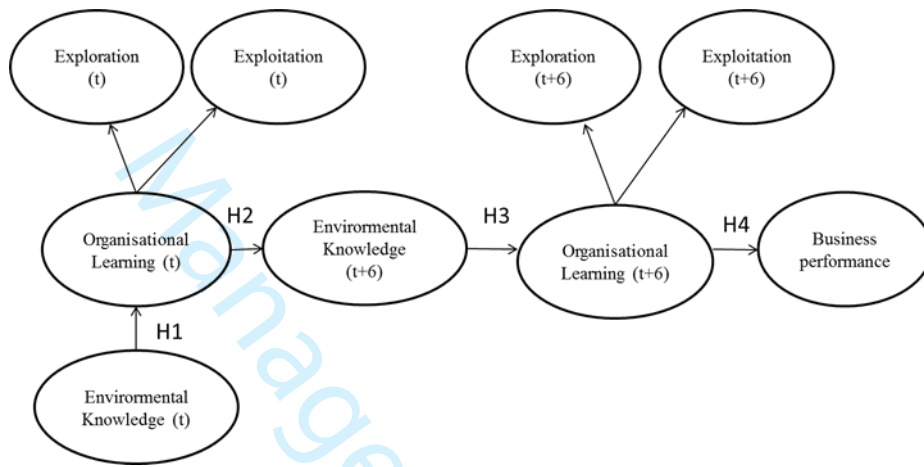
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**Table 1. Key definitions of environmental knowledge**

<b>Definition</b>	<b>Source</b>
'refers to the understanding and retention of information on ecological problems and connexions' (pp. 2)	Martínez-Martínez, Zumel-Jiménez and Cegarra-Navarro (2018)
'is a stronger predictor of private pro-environmental behavior than professional environmental knowledge' (pp. 289)	Duan and Sheng (2018)
'two constructs based on the amount of "real" (objective) and "perceived" (subjective) knowledge with regards to environmental problems and solutions' (pp. 4)	Kim, Kim and Thapa (2018)
'is technology transfer and spillovers' (pp. 382)	Ning and Wang (2018)
'is a significant predictor of environmental behaviour' (pp.86)	Myung (2017)
'shapes environmentally friendly attitudes and more responsible behaviours in relation to the surrounding environment' (pp. 385)	Paço and Lavrador (2017)
'is closer to a wide range of resources for effective action (i.e. procedural knowledge)' (pp. 283)	Martínez-Martínez, Cegarra-Navarro and García-Pérez (2015)
is a process that entails being good at transferring knowledge from one context to another (pp. 225)	Nieves and Haller, (2014)
'embedded explanatory, instrumental and evaluative knowledge, offering the "why" and "how" for the internal organisational agents (i.e. shareholders, management, and employees)' (pp. 343)	Cegarra-Navarro <i>et al.</i> (2013)
'how different approaches can work together to better steward and manage the environment and natural resources' (pp. 2)	Whyte (2013)
'as the knowledge on what people know about the environment, key relationships leading to environmental impacts, an appreciation of the "whole systems", and collective responsibilities necessary for sustainable development' (pp. 148)	Aman, Haru and Hussein (2012)
'it relies upon the recipient actors involved (e.g. farmers, residents or visitors' (pp. 7)	Raymond <i>et al.</i> (2010)
'a key factor in the successful marketing of a product is the identification of what is important to the decision-making process' (pp.2)	Barber, Taylor and Strick (2009)
'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' (pp. 37)	Po-Shin and Li-Hsing (2009)
'are attitudes, which in turn motivate ecologically or environmentally responsible consumer behaviour' (pp. 428)	Haron, Paim and Yahaya (2005)
'a general knowledge of facts, concepts, and relationships concerning the natural environment and its major ecosystems' (pp. 48)	Fryxell and Lo (2003)
as a system that connects data, analysis and people and presents an opportunity to formalise developed ecology in a business environment (pp. 8)	Wernick (2003)
' <i>know-how</i> of all employees and the continuous improvements made in the company's daily practices' (pp. 292)	Boiral (2002)
'can be defined as the degree to which one express concern about ecological issues' (pp.342)	Amyx <i>et al.</i> (1994)

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	<b>0.71</b>								
2. Knowledge Exploration (t)	7.01	1.67	0.87	0.62	0.65	<b>0.79</b>							
3. Knowledge Exploitation (t)	6.56	1.81	0.84	0.57	0.55	0.61	<b>0.75</b>						
4. Organisational Learning (t)	6.78	1.57	n.a.	n.a.	0.67	0.78	0.71	<b>n.a.</b>					
5. Environmental knowledge (t+6)	6.86	1.74	0.64	0.50	0.70	0.61	0.50	0.62	<b>0.71</b>				
6. Knowledge Exploration (t+6)	6.84	1.72	0.79	0.60	0.60	0.75	0.63	0.85	0.63	<b>0.77</b>			
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	<b>0.72</b>		
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	<b>n.a.</b>	
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	<b>0.71</b>

## 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)**

First-order construct	Indicator	First-order Loading	Second-order Loading
Knowledge Exploration R <sup>2</sup> =0.85	KEr_1	0.87 <sup>a</sup>	0.92 <sup>a</sup>
	KEr_2	0.87 <sup>a</sup>	
	KEr_3	0.80 <sup>a</sup>	
	KEr_4	0.82 <sup>a</sup>	
Knowledge Exploitation R <sup>2</sup> =0.80	KEt_1	0.82 <sup>a</sup>	0.89 <sup>a</sup>
	KEt_2	0.85 <sup>a</sup>	
	KEt_3	0.70 <sup>a</sup>	
	KEt_4	0.88 <sup>a</sup>	

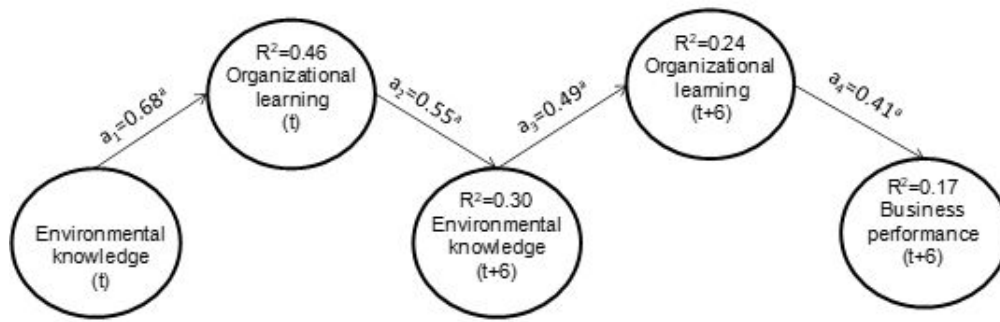
Note: <sup>a</sup> <0.01 [(based on t(4999), two-tailed test); t(0.01, 4999) = 2.577]; Year 2008

**Table 4. Second-order confirmatory factor analysis of Organisational Learning (t+6)**

First-order construct	Indicator	First-order Loading	Second-order Loading
Knowledge Exploration R <sup>2</sup> =0.68	KEr_1	0.78 <sup>a</sup>	0.82 <sup>a</sup>
	KEr_2	0.56 <sup>a</sup>	
	KEr_3	0.56 <sup>a</sup>	
	KEr_4	0.77 <sup>a</sup>	
Knowledge Exploitation R <sup>2</sup> =0.90	KEt_1	0.90 <sup>a</sup>	0.93 <sup>a</sup>
	KEt_2	0.87 <sup>a</sup>	
	KEt_3	0.17 <sup>a</sup>	
	KEt_4	0.90 <sup>a</sup>	

Note: <sup>a</sup> <0.01 [(based on t (4999), two-tailed test); t (0.01, 4999) = 2.577]; Year 2014

Figure 2. Structural equation model



Notes:

Notes: <sup>a</sup> <0.01 [(based on t (4999), two-tailed test); t (0.01, 4999) = 2.577]

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4 Dr. Jay Janney  
5 Editor  
6 Management Research Review  
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8 23 November 2018  
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10 **Re: Manuscript MRR-02-2018-0091.R2 – Revised version**  
11

12 Dear Dr Janney,  
13

14 Thank you for the thoughtful reviews on our manuscript (MRR-02-2018-0091), entitled  
15 “Environmental knowledge strategy: driving success of the hospitality industry”. We  
16 would also like to thank the reviewers for their insightful comments. You have greatly helped  
17 reshape this into a much better paper.  
18

19 We have conducted a thorough revision of the manuscript and considered the feedback received.  
20 Changes made are summarised below and have also been highlighted within the document by  
21 using a different font colour (blue).  
22

23 Thank you for considering the revised version of our manuscript. We look forward to hearing  
24 from you in due course.  
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26 Yours sincerely,  
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28 The authors  
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Manuscript number: MRR-02-2018-0091.R2

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3 **Response to editor and reviewers**

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5 Friday, November 23, 2018

6 Dear Reviewer,

7  
8 Thank you for your constructive and helpful review. We were pleased that you found  
9 our topic interesting. We appreciate the time you put into the review and believe your comments  
10 have significantly contributed to making this a better manuscript. We will summarise or  
11 paraphrase your feedback, shown in italics below, and provide our responses. We will indent  
12 our responses, as we have in this paragraph, and also itemise the responses whenever possible.  
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15 *Content:*

16  
17 #2: *Relationship to Literature:* *Does the paper demonstrate an adequate understanding of*  
18 *the relevant literature in the field and cite an appropriate range of literature sources? Is any*  
19 *significant work ignored?:* I saw little changes in the literature review. Still need an  
20 analytical review not just a summation.  
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23 We have conducted an analytical review of the concept of environmental knowledge.  
24 Based upon this review, to best of our knowledge, the *causal model* shown in Figure has never  
25 been tried before.  
26

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

Definition	Source
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is a process that entails being good at transferring knowledge from one context to another (pp. 225)	Nieves and Haller, (2014)
'embedded explanatory, instrumental and evaluative knowledge, offering the "why" and "how" for the internal organisational agents (i.e. shareholders, management, and employees)' (pp. 343)	Cegarra-Navarro <i>et al.</i> (2013)
'how different approaches can work together to better steward and manage the environment and natural resources' (pp. 2)	Whyte (2013)
'as the knowledge on what people know about the environment, key relationships leading to environmental impacts, an appreciation of the "whole systems", and collective responsibilities necessary for sustainable development' (pp. 148)	Aman, Haru and Hussein (2012)
'it relies upon the recipient actors involved (e.g. farmers, residents or visitors)' (pp. 7)	Raymond <i>et al.</i> (2010)
'a key factor in the successful marketing of a product is the identification of what is important to the decision-making process' (pp.2)	Barber, Taylor and Strick (2009)
'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' (pp. 37)	Po-Shin and Li-Hsing (2009)
'are attitudes, which in turn motivate ecologically or environmentally responsible consumer behaviour' (pp. 428)	Haron, Paim and Yahaya (2005)
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'can be defined as the degree to which one express concern about ecological issues' (pp.342)	Amyx <i>et al.</i> (1994)

Source: own elaboration

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4 #5: *Implications for research, practice and/or society:* **Does the paper identify**  
5 *clearly any implications for research, practice and/or society? Does the paper bridge*  
6 *the gap between theory and practice? How can the research be used in practice*  
7 *(economic and commercial impact), in teaching, to influence public policy, in research*  
8 *(contributing to the body of knowledge)? What is the impact upon society (influencing*  
9 *public attitudes, affecting quality of life)? Are these implications consistent with the*  
10 *findings and conclusions of the paper?:* Better when reorganized with the same ideas,  
11 minor changes were made. Expand your conclusion  
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13  
14 We are pleased that you have noticed the changes we have made and following its  
15 recommendation we have explained four possible practical implications to improve the  
16 conclusions of this research. As follows:  
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19 *(...)A second practical implication is directly evidenced by our results, hotels with*  
20 *environmental learning practices can improve their business performance, this result*  
21 *can to motivate to the managers to take care of the environment precisely because these*  
22 *actions will benefit them. The profits can be produced in two different ways, on the one*  
23 *hand, improved the sales and the other hand, to reduce the cost associate to their*  
24 *services (eg. if their worker have more environmental knowledge can choose better*  
25 *their actions on environment and optimize the cost that can imply its environmental*  
26 *unknowledge).*  
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30 *A third practical implication is directly related with the strategy that managers can*  
31 *decide to implement, Will they use this result as a marketing strategy or can they use it*  
32 *in their strategic direction? In both cases the environment can be benefited, it would be*  
33 *interesting to study in the future the motivations that managers have to incorporate into*  
34 *their hotel management strategy. In addition to what kind of strategy are they*  
35 *implementing, management and / or marketing.*  
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39 *A fourth practical implication is from the perspective of corporate social responsibility,*  
40 *this research is focus on how the hotels which have an environmental knowledge*  
41 *practices can improve their performance, specifically business performance but the*  
42 *hotels with practices and eco-friendly image could also increase their social*  
43 *performance. As is known, environmental aspects are one of the pillars of corporate*  
44 *social responsibility. Stakeholders can perceive better the hotels that take care of the*  
45 *environment compared to those that do not have environmental care practices and this*  
46 *is reflected in their social performance (eg. reputation or perceived image). In this*  
47 *sense, enabling different stakeholders to share their goals and interactions will help*  
48 *make the environmental issues of what should be done to bring about the most desired*  
49 *consequences through the shared planning process clear. This practical implication*  
50 *could be a future line of research because it is necessary to measure the impact of*  
51 *environmental knowledge on social performance.*  
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57 *A fifth practical implication is that hotels' managers can introduce in their management*  
58 *and their decision making policies for the training of workers focused on acquiring,*  
59 *updating and renewing environmental knowledge, in this aspect, managers could assess*  
60 *the level of obsolete knowledge that their workers have, according to the current*



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*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.*

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