



# The use of gamification in environmental interpretation and its effect on customer-based destination brand equity: The moderating role of psychological distance

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## ABSTRACT

This study seeks to contribute to the literature dealing with the formation of customer-based destination brand equity (CBDDE) using an environmental interpretation strategy. It aims to establish whether (i) participation in an environmental interpretation experience with a gamified design may exert a greater effect on CBDDE than participation in a non-gamified version; (ii) CBDDE is influenced by the tourist's psychological distance relative to the destination in question; and (iii) psychological distance moderates the effect of environmental interpretation (gamified vs. non-gamified) on CBDDE. A quasi-experiment is designed in which the environmental interpretation is manipulated (gamified vs. non-gamified).

The results show that the effect of a gamified environmental interpretation experience on CBDDE is greater than that of a non-gamified version; and that it is greater among participants who perceive the destination to be psychologically near. The study also finds that there is a regulatory construal fit between the use of a gamified design and psychological distance, such that perceived psychological distance exerts a moderating effect on the relationship between interpretation type (gamified vs. non-gamified) and CBDDE. It is identified that, when the destination is perceived to be psychologically distant, the gamified environmental interpretation generates significantly greater CBDDE than the non-gamified version. By contrast, when it is psychologically near, there are no significant differences in CBDDE between a gamified and a non-gamified environmental interpretation experience. These results are relevant both for the literature and for the professional tourism sector, which, by its very nature, operates in an international context.

## 1. Introduction

Fierce competition between tourist destinations requires them to have a competitive advantage in the market (Pike & Page, 2014), and brand equity is considered a key variable to achieve this (Bastos & Levy, 2012). Sound management of brand equity helps secure differentiation in the tourism market, rendering the destination more popular and preferred among tourists, compared to other destinations (Kim & Lee, 2018).

The consumer's perception of a destination's brand value—hereafter, customer-based brand equity (CBBE) or, if it is applied to tourist destinations, customer-based destination brand equity (CBDDE)—begins when they acquire greater knowledge of the destination and evolves as

they hold it in incrementally higher regard in terms of image, quality, perceived value, and loyalty. Increasingly in recent decades, CBDDE is also affected by the destination's state of conservation (Negrușă, Toader, Sofică, Tutunea, & Rus, 2015). Hence, it is important that destinations invest in reconciling the development of tourist activities with the protection and conservation of the natural resources that form the very basis of those activities (Blancas, Lozano-Oyola, & González, 2015) and with the long-term development of tourism (Thiel-Ellul & Navarro-Jurado, 2014, pp. 1–26). The need to strike this balance was further underlined recently by Gossling, Scott, and Hall (2020, p.15) in the context of the COVID-19 pandemic. The latter authors argue that “there is an urgent need not to return to business-as-usual when the crisis [is] over” but instead to focus on delivering “a transformation of

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the global tourism system more aligned to the SDGs [United Nations Sustainable Development Goals]". Sustainability is therefore a key factor for competitiveness (Pulido Fernández, 2004).

The use of environmental interpretation, an environmental education tool (Powell, Vezeau, Stern, Moore, & Wright, 2018), is an effective strategy for building the sustainability of tourist destinations (Ballantyne, Hughes, Lee, Packer, & Sneddon, 2018; Coghlan & Kim, 2012) by encouraging pro-environmental behavior among tourists (Ballantyne et al., 2018). This strategy is also known to generate more satisfying, enjoyable experiences for tourists (Powell & Ham, 2008), leading to positive effects on consumer behavior (Ballantyne et al., 2018). Although the positive effects of environmental interpretation are widely acknowledged, in terms of destination sustainability and different variables of consumer behavior, it is of interest to better understand whether its use improves CBDBE.

To be effective, environmental interpretation must take into account factors linked to its design and the characteristics of the target audience (Powell, Kellert, & Ham, 2009). First, with regard to the design of environmental interpretation, advances in information and communications technologies (ICTs) offer new possibilities, such as the development of gamification experiences that do not rely on human interaction, yet still retain the interactivity offered by ICTs (Coghlan & Carter, 2020). Furthermore, the implementation of environmental interpretation using ICTs renders it possible to implement diverse designs, from simple multimedia information brochures, for instance, to gamification. The incorporation of a gamified design offers interesting possibilities because gamified services can transform a participatory experience into one that is intrinsically motivating and enjoyable (Huotari & Hamari, 2012, 2017). It is this potential that has led to the growing interest in establishing whether the implementation of an ICT-based environmental interpretation experience with a gamified design has the capacity to generate a more significant experience for the participant and a greater effect on their behavior compared to the use of a non-gamified version.

Second, with regard to the characteristics of the public at which the environmental interpretation is targeted, the international nature of the tourists must be considered. In the tourism context, scholars have identified that psychological distance influences variables related to CBDBE such as loyalty (Shin, Chung, Kang, & Koo, 2016, pp. 355–368), meaning that, under identical circumstances, a stimulus that is perceived to be psychologically near leads to better results in terms of consumer behavior than one perceived to be psychologically distant. This points to the need to identify designs for environmental interpretation that are effective—that is, sensitive to tourists' perceptions of the destination as psychologically near or distant. Hence, it is relevant to examine whether the effectiveness of a gamified environmental interpretation, implemented via ICTs, can be affected by the psychological distance of the tourists.

The objective of the present study, then, is to establish whether the use of gamified environmental interpretation, implemented via ICTs, is an appropriate strategy for achieving greater CBDBE and whether this effect may be moderated by the tourist's psychological distance relative to the destination. The research seeks to understand whether (a) participation in an environmental interpretation experience with a gamified design may exert a greater effect on CBDBE than participation in a non-gamified version, (b) CBDBE is influenced by the tourist's psychological distance relative to the destination in question, and (c) that psychological distance moderates the effect of environmental interpretation (gamified vs. non-gamified) on CBDBE.

The study makes several new contributions to the literature. First, it provides greater knowledge about the effectiveness of the use of environmental interpretation in tourist destinations, and about how its use may contribute to developing a competitive advantage based on CBDBE.

Second, it employs the latest ICTs to design a gamified environmental interpretation experience for tourists, taking into account that the gamification element must be designed and implemented by taking

full advantage of its ability to generate an experience that feels personal to each participant.

Third, the study takes into account a particular characteristic of tourists—namely, their psychological distance from the destination—to a) assess its effect on CBDBE and b) based on regulatory construal fit, assess its influence on the effect of environmental interpretation type (gamified vs. non-gamified) on the achievement of CBDBE.

## 2. Literature review

### 2.1. Environmental interpretation and its effect on CBDBE

The measurement of CBBE is based on understanding how marketing initiatives impact on consumers' acquisition and recall of brand information (Pike, Bianchi, Kerr, & Patti, 2010). According to Keller (1993), CBBE can be conceptualized as "the differential effect of brand knowledge on consumer response to the marketing of the brand." In terms of its scope, including CBDBE, the majority of studies hold that CBDBE comprises a number of dimensions that are highly relevant to consumer behavior (Bianchi, Pike, & Lings, 2014). The majority of studies measuring CBBE use the following dimensions: (a) brand awareness; (b) brand quality; (c) brand image; (d) brand value; and (e) brand loyalty (e.g. Kladou & Kehagias, 2014; Pike et al., 2010; Zavattaro, Daspit, & Adams, 2015). This suggests that CBDBE can be considered a consumer behavior variable compatible with the learning potential that can be achieved through environmental interpretation (which also has the scope to influence destination awareness and image). It also indicates that CBDBE is compatible with destination competitiveness, due to its potential to improve the tourist's experience of the destination and influence its perceived quality, perceived value, and loyalty toward it. However, more recent advances in the specialized literature on CBDBE, have taken a more all-embracing perspective: that of overall brand equity (OBE) (Yoo & Donthu, 2001). These latter works define OBE as "consumers' different response between a focal brand and an unbranded product when both have the same level of marketing stimuli and product attributes." The present study takes this more holistic perspective of CBDBE measurement, echoing other recent studies in the tourism field (Frías-Jamilena, Polo-Peña, & Rodríguez-Molina, 2017).

Nevertheless, there are few studies that seek to identify possible antecedents with which to work to improve CBDBE. Among the exceptions are: Ferns and Walls (2012), which proposes a model to examine the effect of enduring travel involvement on CBDBE; Frías Jamilena, Polo Peña, and Rodríguez Molina (2017), which finds that the level of value created by a tourist as a result of their interactions with different participants at the destination is an antecedent of CBDBE; Frías-Jamilena, Sabiote-Ortiz, Martín-Santana, and Beerli-Palacio (2018), which demonstrates the effect of Cultural Intelligence on CBDBE; and Cano-Guervos, Frías-Jamilena, Polo Peña, and Chica Olmo (2020), which examines the indirect effects that tourists from a nearby geographical location may exert on CBDBE, due to their proximity and shared context.

As CBDBE will be affected by the destination's state of conservation (Negruşa et al., 2015), it is important to strike a healthy balance between tourism-related activities and the protection and conservation of the natural resources that serve as the very basis for those activities (Blancas et al., 2015). In this regard, environmental interpretation is one of the most widely-used tools to educate tourists about the environmental conservation of destinations (Ardoin, Wheaton, Bowers, Hunt, & Durham, 2015). It has also been found to improve the tourist experience (Moncada, Aranguren, & Pellegrini, 2016). From these findings of the literature, it can be inferred that environmental interpretation can be an effective strategy for improving CBDBE, given that this variable is linked to learning about the destination (meaning improved destination awareness and image) and to the enhancement of the tourist experience (which is associated with higher perceived destination quality and perceived value, as well as loyalty).

According to Ham (1992), environmental interpretation translates

technically or scientifically complex information into language and ideas that non-experts can readily understand, while enhancing visitor satisfaction. However, various studies on environmental interpretation and its effectiveness call for further research (Coghlan & Carter, 2020), as these types of experiences are complex, involving multiple factors that shape their success or failure (Powell et al., 2009). The present literature review identifies that such influential factors can be broadly grouped into two groups: 1) those related to the design of environmental interpretation experiences and 2) those associated with the characteristics of the participants themselves (Table 1).

Among the factors associated with the design of environmental interpretation experiences, the literature highlights the potential of ICTs, which can provide design features that sustain interaction with participants without the need for personnel (Coghlan & Carter, 2020), generate opportunities for implementation in other contexts (ibid.), and enhance the tourist experience (Xu, Buhalis, & Weber, 2017; Xu, Tian, Buhalis, Weber, & Zhang, 2016). Given this potential offered by ICTs, a step further is to harness technology to incorporate a gamification approach into the interpretation design. The participant's experience of this gamified approach, or its impact on tourist behavior, can then be analyzed. Examining gamification involves building on the contributions of the previous literature, which, in the main, allude only briefly to the inclusion of different games in the interpretation experience (Hughes, Packer, & Ballantyne, 2011); other exceptions include works that associate game literature and interpretation with theoretical frameworks linked to gamification (Coghlan & Carter, 2020).

With regard to the individual characteristics of the participants, Table 1 shows that there are variables relating to their particular profile and context that should be taken into account when designing the environmental interpretation experience: previous experience/no

**Table 1**  
Factors that influence the effectiveness of environmental interpretation.

Factors linked to the design of environmental interpretation experiences	<ol style="list-style-type: none"> <li>1) Interaction with staff (Ballantyne et al., 2009; Botha, Saayman, &amp; Kruger, 2016; Coghlan et al., 2011; Coghlan &amp; Kim, 2012; Lee, 2009; Powell et al., 2009; Powell &amp; Ham, 2008; Walker &amp; Moscardo, 2014).</li> <li>2) Duration (Powell et al., 2009; Wolf et al., 2013).</li> <li>3) Number of interpretive media used—that is, participation in different activities and extent of exposure to the interpretation (Coghlan et al., 2011; Coghlan &amp; Kim, 2012; Kim, 2012; Powell et al., 2009; Weiler &amp; Smith, 2009).</li> <li>4) Use of ICTs to implement the interpretation (Coghlan &amp; Carter, 2020; Davies, 2014; Hughes et al., 2011; Wolf et al., 2013).</li> </ol>
Factors linked to the characteristics of the participants	<ol style="list-style-type: none"> <li>1) Previous experience of this type of activity, directly linked to environmental sustainability (Coghlan et al., 2011; Kim, 2012; Weiler &amp; Smith, 2009).</li> <li>2) Subjective norms (Bamberg, 2002; Kim, Airey, &amp; Szivas, 2011).</li> <li>3) Concern for environmental issues (Ballantyne et al., 2011; Hughes et al., 2011; Powell et al., 2009).</li> <li>4) Socio-demographic factors, such as age (Ballantyne et al., 2011; Cheung &amp; Fok, 2014; Kim, 2012), gender (Ballantyne et al., 2011; Kim, 2012; Powell et al., 2009), country of origin (native or foreign) (Ballantyne et al., 2011; Botha et al., 2016; Kim, 2012; Weiler &amp; Smith, 2009), occupation (Cheung &amp; Fok, 2014), salary level (Cheung &amp; Fok, 2014) or educational level (Kim, 2012; Powell et al., 2009).</li> </ol>

Source: The authors

previous experience of this type of activity, subjective norms, environmental concern, or sociodemographic variables. The effect of the latter, sociodemographics, on the effectiveness of participation in environmental interpretations has already been analyzed, and, from this starting point, the present study seeks to examine other variables. Considering the international context of touristic activity, it is of interest to select a variable that captures tourists' perceptions of the psychological distance or nearness of the destination in question. Given the consensus among researchers regarding the importance of psychological distance in individuals' evaluations and decision-making, and the significant impact it can exert on their behavior (Lieberman, Trope, & Wakslak, 2007; Trope, Liberman, & Wakslak, 2007), it is to be expected that psychological distance will also influence the effectiveness of environmental interpretation—meaning that its design needs to be adapted to fit the target audience accordingly. As shown in Table 1, the effectiveness of environmental interpretation experiences on consumer behavior, taking into account their perceived psychological distance from the target audience, has not been analyzed in the literature to date.

The present study seeks to address these gaps in the literature by a) designing an environmental interpretation experience that takes advantage of the potential of ICTs to incorporate gamification design features and b) using a factor linked to the characteristics of individual participants, namely psychological distance.

## 2.2. The use of gamification in environmental interpretation and its effect on CBDDE

The concept of 'gamification' was first used in 2008 in an online blog post, with the first academic research on the topic being published in 2011. Initially, scholars adopted an exclusively systemic perspective on this concept—an approach that was subsequently criticized by some authors for failing to take into account the participant experience (Huotari & Hamari, 2012, 2017). Researchers are now beginning to consider how to measure the experiential aspect of games as this is essential for identifying whether gamification is effective from the end-user perspective and as a fundamental step in determining the impact of that effectiveness on consumer behavior variables (Huotari & Hamari, 2017) (Table 2).

Although the literature demonstrates the need to incorporate the participant's gameful experience in any empirical analysis of gamification's impact, more knowledge and understanding of this perspective are required (Huotari & Hamari, 2017). While a gameful experience is considered key to the design and use of gamification features (Hamari, Koivisto, & Sarsa, 2014), there is no consensus on its dimensions, nor on how to measure it (Deterding, Dixon, Khaled, & Nacke, 2011; Huotari & Hamari, 2017). However, the contributions of Eppmann, Bekk, and Klein (2018) and Liu, Wang, Huang, and Tang (2019) are considered to be of particular importance for this question. The respective scales developed by these authors concur that it is important to include a specific dimension to reflect participants' enjoyment, while Liu et al. (2019) highlight how important it is for gamification to stimulate the intrinsic motivation of participants.

According to Self-Determination Theory, which is widely applied in research dealing with gamification (Seaborn & Fels, 2015), intrinsic motivation is determined by three basic psychological needs: autonomy, competence, and relatedness. When these needs are satisfied, the subject's intrinsic motivation improves (Deci & Ryan, 1985). As shown in Table 3, people's basic needs can be satisfied by participating in a gamified experience supported by a system of affordances. The term 'affordance' refers to inherent motivational elements that encourage specific activities among participants.

The 'enjoyment' element refers to a specific state of happiness or entertainment generated by a pleasant experience (Merhi, 2016), beyond the specific result achieved out of that experience (Holbrook, 1994, pp. 21–71). This feeling should be considered a facet of participation in games (Ha, Yoon, & Choi, 2007).

**Table 2**  
Evolution of scholarly study of gamification.

Timeframe	Main milestones	Characteristics
2008	First appearance of the term	Described in a blog as: “taking game mechanics and applying them to other web properties to increase Engagement” (Terril, cited in Huotari & Hamari, 2012).
From 2010	Use of gamification in firms	Attracts and retains customers and motivates workers. Success stories include Nike, Samsung, Foursquare and Pepsi (Hsu et al., 2017).
From 2011 onward	First academic studies published	Researchers show interest in games, aiming to unravel what makes them so enjoyable and motivating (Deterding, 2015).
	Main definitions and perspectives from which gamification is explored	A broader definition is developed: “The use of game design elements in non-game contexts” (Deterding et al., 2011). “Gamification refers to a process of enhancing a service with affordances for gameful experiences in order to support user” overall value creation” (Huotari & Hamari, 2012, 2017).

The primary spheres of application of gamification proposed by the literature are education and learning, health and physical fitness, and crowdsourcing. Less prominent areas include: social behavior and networking, business and management, ecological/environmental behavior, e-commerce, marketing and consumer behavior, entertainment, transport, culture, and tourism (Koivisto & Hamari, 2019).

Source: The authors

**Table 3**  
Basic psychological needs of motivation, and affordances designed to satisfy those needs via a gamified experience.

Basic psychological needs	Meaning	Affordances with the capacity to influence the satisfaction of a need	Examples of affordances incorporated into gamified experiences to influence the satisfaction of basic psychological needs
Autonomy	A feeling of being able to choose whether to perform a task or not and of choosing how to do it (Burgers, Eden, Van Engelenburg, & Buningh, 2015).	Affordances that give control to the user, enabling them to exercise their own will (Burgers et al., 2015).	Profiles, avatars, privacy control, configurable interface, notification control, alternative activities, non-controlling instructions, levels, narrative.
Competence	Feeling of having the ability to perform the task and achieve the objectives (Xu et al., 2017).	Affordances of challenge and expertise (Xu et al., 2017).	Positive feedback, progressive information, levels, leaderboards, points, challenges, intuitive control, status and badges.
Relatedness	Desire to feel connected to other people with a sense of recognition and acceptance (Koivisto & Hamari, 2019).	Affordances that enable interaction and connection with other individuals (Xu et al., 2017).	Groups, messages, blogs, chat, connection to social networks, collaboration tasks, gifts to other users.

Source: The authors

In the context of gamification, enjoyment is understood as spontaneity in users’ interaction with the gamification system (Hamari & Koivisto, 2015a). In other words, enjoyment refers to users’ exploratory and creative behavior when interacting with the system (Hamari & Koivisto, 2015a). The generation of enjoyment helps the participant persevere with the longer-term behaviors promoted by the gamification experience (Deci & Ryan, 1985; Wu & Liu, 2007). Enjoyment also influences how consumers respond to a product innovation (Aroean, 2012), and it also increases people’s interest in making discoveries, such as exploring new ideas or products (Hoffman & Novak, 1996).

Gamification can be considered a valid approach to apply in different contexts (Table 3), as recognized by the literature, which points to spheres including education and learning, health and physical fitness, and crowdsourcing. The tourism and marketing fields, for instance, can be deemed emerging areas that require further research in this regard (Koivisto & Hamari, 2019). In the tourism context, the literature attributes benefits to the use of gamification before, during, and after the trip (Xu et al., 2017). Participation in gamification has been found to generate: a gameful (motivating and enjoyment) experience (Huotari & Hamari, 2012, 2017); a better tourist experience (Xu et al., 2016, 2017); a more positive affective and behavioral response to the brand or tourist destination on the part of the participant (Hamari & Koivisto, 2014; Xu et al., 2017); a higher level of satisfaction; and increased loyalty and commitment to the destination (Abou-Shouk & Solliman, 2021; Xu et al., 2016, 2017). In the field of sustainable tourism specifically, studies including those of Souza, Marques, and Veríssimo (2020) and Negrușă et al. (2015) analyze the techniques and applications that must be taken into account when gamification is used to address a conservation problem in destinations specializing in sustainable tourism. In light of these considerations from the literature, it is of value to contribute empirical evidence of the possible superior effect of gamification on a key variable of consumer behavior—namely, CBDBE—compared to the effect of a non-gamified tourist environmental interpretation experience. It is also relevant to capture the participant’s perspective when measuring the gameful experience. Based on the literature review, it is anticipated that a gamified environmental interpretation experience will achieve better results in terms of CBDBE than a non-gamified experience. Therefore, the following hypothesis is proposed:

**H1.** A gamified environmental interpretation experience will have a significantly greater positive effect on CBDBE than a non-gamified environmental interpretation experience.

### 2.3. The effect of psychological distance on CBDBE

The term ‘psychological distance’ was first used by Lewin (1951) (cited in Van Boven, Kane, McGraw, & Dale, 2010) and later defined by Trope and Liberman (2010) as the “subjective experience that something is close or far away from the self, here, and now”. Psychological distance is defined according to the individual’s perception of how near or distant an object, place, or event—in short, a given stimulus—is from their direct experience. It takes into account temporal distance (*when* that stimulus arises), spatial distance (*where* it arises), social distance (*in relation to whom* it arises) and hypothetical distance (the *likelihood* that it will arise). Even if the stimulus conveys equivalent information to different people, the individual will represent it as psychologically near or distant depending on the perceived distance from his or her direct experience (Miao & Mattila, 2013).

Trope and Liberman (2010) contend that psychological distance comprises the aforementioned dimensions—spatial, temporal, social and hypothetical—and that these are interrelated. This means that what influences one dimension can also influence the rest (Spence, Poortinga, & Pidgeon, 2012).

The main theoretical basis for the concept of psychological distance is construal level theory, which holds that psychological distance is linked to a level of construction or mental conceptualization of



perceived reality (Liberman & Trope, 2014; Trope & Liberman, 2010). Thus, psychological distance regulates how the individual perceives the stimulus, such that it will seem safe or uncertain, familiar or strange, similar or different—in short, near or distant. And this perceived distance will fundamentally influence their decisions and behavior (Tan & Chang, 2015). In general terms, the literature demonstrates that the lesser the perceived psychological distance, the greater the effectiveness of marketing actions. Psychological proximity has been found to improve a consumer's confidence and purchase intention (Darke, Brady, Benedicktus, & Wilson, 2016) as well as brand attitude, preference, and use (Lii, Wu, & Ding, 2013).

In the tourism sphere, psychological distance is considered a key factor in tourist destination visit intention (Shin et al., 2016, pp. 355–368), attitude (Kim, Kim, Kim, & Magnini, 2016), loyalty (Tan & Chang, 2015), and customer experience (Miao & Mattila, 2013), among other aspects. The present study aims to contribute to the extant literature by providing empirical evidence on the effect of psychological distance on one of the primary variables of consumer behavior, CBDDE—a variable of significant interest, given both its relevance and its complexity. In light of the literature review, it is anticipated that the effect of an environmental interpretation strategy on CBDDE will differ according to the psychological distance perceived by the consumer relative to the interpretation experience (the stimulus). Therefore, the following hypothesis is proposed:

**H2.** CBDDE will be significantly greater when the consumer perceives the stimulus to be psychologically near than when they perceive it as psychologically distant.

#### 2.4. The moderating effect of psychological distance on the effectiveness of gamified environmental interpretation in terms of CBDDE

The effects of environmental interpretation on consumer behavior variables can be improved if a good match can be achieved between the stimulus and the individual's mindset (Chou & Lien, 2012). One way to achieve this is by "regulatory construal fit", which involves producing a correspondence between the individual's regulatory focus and the level at which they construe information (Lee, Keller, & Sternthal, 2010).

According to regulatory focus theory (Higgins, 1997), any behavior in pursuit of a goal will be regulated by two different focuses: promotion vs. prevention. Each focus has distinct underlying concerns, such that individuals with a promotion focus tend to be concerned with progress, growth and achievements, while those with a prevention focus are more concerned with their protection, their safety, and their responsibilities (Higgins et al., 2001). People who adopt a promotion focus will be highly sensitive to the presence or absence of positive outcomes, while those presenting a prevention focus will be more sensitive to the presence or absence of negative outcomes (Chou & Lien, 2012).

According to construal level theory, if the individual perceives the stimulus to be psychologically near, a low-level construal is activated, and if they perceive it to be psychologically distant, requiring a greater cognitive effort, a high-level construal will be activated (Trope & Liberman, 2010). Each level is determined by a series of characteristics (Liberman & Trope, 2014). Thus, individuals who perceive the stimulus to be psychologically near construe it in a specific, detailed and subordinate way (a low-level construal), while those who perceive it as psychologically distant will construe it in abstract, general and superordinate terms (a high-level construal) (Kim et al., 2016; Liberman & Trope, 2014). The activation of high-level construal increases the relevance of the desirability of an outcome; and the activation of low-level construal increases the relevance of the feasibility of the means necessary to achieve that outcome (Liberman & Trope, 1998; Scarpi, 2021).

On this premise, regulatory construal fit can be achieved (Lee et al., 2010) when a promotion focus is combined with a high-level construal or a stimulus that is perceived to be psychologically distant, or when a

prevention focus meets a low-level construal or a perception of psychological nearness. Numerous studies have explored the connection between construal level theory and regulatory focus theory (Chou & Lien, 2012; Lee et al., 2010). These authors began to link regulatory focus with the construal level, considering the attributes that characterize the stimuli to which individuals are exposed.

In the present research, it is hypothesized that environmental interpretation is aligned with a prevention focus and that, therefore, a regulatory construal fit will be produced among individuals with low-level construal (stimulus psychologically near). It is also hypothesized that gamification is aligned with a promotion focus, which will produce a regulatory construal fit among individuals with high-level construal (stimulus psychologically distant). These propositions are based on the premise that one of the major differences between the promotion focus and the prevention focus is that latter is concerned with *preventing negative outcomes*, while the former helps the individual in *achieving positive outcomes* (Chou & Lien, 2012). Furthermore, individuals with a prevention focus regulate their attitudes and behaviors to attain safety and security, whereas those with a promotion focus regulate their attitudes and behaviors to attain growth and achievement (Lee et al., 2010). Hence, any stimulus or message that emphasizes one of these two aspects can be considered to align with one of the two focuses.

A further hypothesis is that the design of a non-gamified environmental interpretation may be particularly associated with a prevention focus because the great majority of environment interpretation experiences emphasize the costs or consequences of failing to take (environmentally-friendly) action as well as the safety of participants (Coghlan, Ruth Fox, Prideaux, & Lück, 2011; Tan & Law, 2016). For example, Wiener, Needham, and Wilkinson (2009) found that the majority of tourism firms that offered an environmental interpretation service in Hawaii focused solely on the personal safety of participants.

Conversely, the findings of a number of previous studies point to the possibility that a gamified environmental interpretation experience may be aligned with a promotion focus. Ashraf, Razzaque, and Thongpapanl (2016), for example, found that promotion-focused individuals tend to have a hedonic orientation. In a very recent study, Scarpi (2021) demonstrates that hedonism is related to high-level construal (considering hedonism to refer to fun and enjoyment). Previous research has consistently linked enjoyment—one of the basic effects of the gameful experience—to the promotion focus and high-level construal. The present research extends this analysis by positing that gamification aligns with a promotion focus, not only due to the 'enjoyment' aspect but also the fundamental premise of gamification—that its inherent reward system helps fulfill the participant's need for achievement (Lee & Higgins, 2009). Gamification is an achievement system (Harwood & Garry, 2015) that shows the participant their progress toward the final goal. Some gamification designs include features such as a progress bar to indicate progress even more clearly (Sigala, 2015). In short, the gamified experience enables participants to fulfill their ideals and emphasizes the goals they can achieve; hence, it can be considered to be consistent with the promotion focus. On this basis, the present study takes this association and extends it, associating a *gamified environmental interpretation experience* with a promotion focus and a *non-gamified* version with a prevention focus.

Therefore, it may be that regulatory construal fit occurs among those individuals who feel psychologically near to the destination and are exposed to a *non-gamified* environmental interpretation experience, and in those who feel psychologically distant from the destination and are exposed to a *gamified* interpretation experience. However, to date, the effect of the design-type of the environmental interpretation experience (gamified vs. non-gamified) and of the characteristics of the participants in terms of their psychological distance (near vs. distant) have not been analyzed jointly. A joint examination of the two factors would make it possible to determine whether a regulatory construal fit between them is possible.

The literature proposes that regulatory construal fit influences

consumer behavior variables (Chou & Lien, 2012), generating more positive brand attitude (Chang, Zhang, & Xie, 2015; Lee et al., 2010), greater purchase intention (Chang et al., 2015), willingness to pay a higher price (Mogilner, Aaker, & Pennington, 2008), and improved engagement (Lee et al., 2010).

Based on these findings, it is anticipated that, if there is a regulatory construal fit between the design type of the environmental interpretation experience (gamified vs. non-gamified) and the psychological distance of the individual (near vs. distant), this will be reflected in the CBDDE. An environmental interpretation experience with a gamified design is expected to achieve regulatory construal fit among tourists who perceive that stimulus to be psychologically distant. The following hypotheses are therefore proposed:

**H3.** The psychological distance perceived by the participant moderates the effect of environmental interpretation type on CBDDE.

**H3a.** When the participant perceives the stimulus to be psychologically distant, a gamified environmental interpretation experience generates significantly greater CBDDE than a non-gamified environmental interpretation experience.

However, in the case of participants who perceive the stimulus to be psychologically near, the premises of regulatory focus theory indicate that they would gravitate toward a prevention focus, which is more typical of a non-gamified environmental interpretation design (that is, aimed at conveying safety information explaining how to fulfill their obligations and emphasizing safety). This implies that, according to these premises developed in the literature, a regulatory fit could occur between tourists who perceive the stimulus to be psychologically near and non-gamified environmental interpretation. That said, a gamified environmental interpretation experience still contains, in essence, the same information and characteristics as the more typical non-gamified environmental interpretation. A gamified version therefore provides the features that participants who perceive a lesser psychological distance—those with a prevention-focused regulatory orientation—most desire, because, as noted above, this design explains how to fulfill their obligations and emphasize safety. Huotari and Hamari (2012, 2017) contend that a gamified offer is a package of services comprising a core service that then incorporates a service enhanced by *affordances* that deliver a *gameful* experience for participants, where the enhanced service supports the core service and not the other way around. Thus, the effect on individuals who perceive the stimulus to be psychologically near will not be affected by the *type* of environmental interpretation (gamified vs. non-gamified) to which they are exposed. Therefore, the following hypothesis is proposed:

**H3b.** When the participant perceives the stimulus to be psychologically near, the type of environmental interpretation (gamified vs. non-gamified) will generate no significant differences in the CBDDE.

Fig. 1 shows the proposed research model, where: participation in a gamified interpretation will generate a greater effect on CBDDE than in a non-gamified version (H1); the participants who perceive the stimulus to be psychologically near will present a higher level of CBDDE than those who perceive it to be psychologically distant (H2); and psychological distance exerts a moderating effect on the relationship between participation in a non-gamified vs. gamified environmental interpretation experience and CBDDE (H3).

### 3. Methodology

#### 3.1. Sample and procedure

Spain was chosen as the tourist destination for the present analysis because, for several decades, it has remained among the top five most popular world destinations in terms of international tourist arrivals (UNWTO, 2020). At the same time, there are several issues that put the

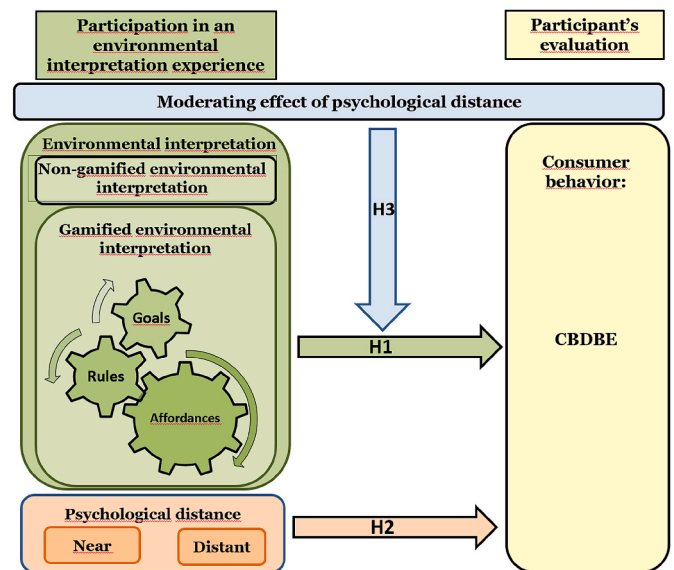


Fig. 1. Research model proposed.

sustainability of the Spanish tourism sector—and its profitability—at risk in the long term (de Industria and Turismo, 2019), while the sector also needs to be reoriented to stimulate recovery post-pandemic (Ribes-Noguera, Canós-Darós, & Santandreu-Mascarell, 2020).

Turning to the methodology, the sample subjects had to meet two conditions to be able to participate in the experiment. They had to be of legal age and never to have visited Spain before, this latter requirement being intended to avoid the possible effect of past experience of the destination on the dependent variable. In line with other studies that deal with more than one nationality, the chosen study population comprised British and American tourists who were potential first-time visitors to Spain (Pike, Pontes, & Kotsi, 2021). Their shared language, English, was the language used in the quasi-experiment on environmental interpretation presented here (both gamified and non-gamified). Furthermore, the United Kingdom and the United States are representative nationalities for Spain (INE, 2020).

Participants were selected via an Internet user panel managed by Dynata. This company has approximately 30 offices in over 20 countries, and has a solid track record in such international research, completing 100 million surveys in 2018 alone. Its Internet user panel comprises over 7 million users in the US and UK, aged 18 years or above. Drawing on this information, the company assisted in the process by accurately selecting the target population and achieving sample representativeness for the study. In the case of quasi-experiments, sample size needs to be geared to enable the treatments to be manipulated in an authentic, non-artificial environment (Zikmund, 1998). Hence, a minimum sample size must be determined that will ensure the statistical tools can be used with a good degree of confidence, meaning that it should be based on the number of treatments proposed in the quasi-experiment.

Initial contact with the participants was made via an email that contained a website link. Those who chose to click on the link were redirected to a secure intranet containing the questionnaires and the experimental stimulus. From this point on, the procedure comprised three steps. In step 1, before being exposed to the experimental stimulus, the participants were asked to respond to an initial questionnaire to gather information on each individual's prior image of Spain, level of environmental concern, and subjective norms. In phase 2, each person was randomly assigned to one of the two experimental treatments (gamified vs. non-gamified multimedia environmental interpretation experience). In the third and final step, participants were exposed to the stimulus and controlled the minimal exposure time in both treatments. Participants were then asked to respond to the second questionnaire,

which covered the dependent variable CBDBE, manipulation checks, psychological distance, and the sociodemographic variables gender, age and employment status.

A final sample of 314 valid subjects was thus obtained. The control group comprised individuals exposed to the non-gamified version of the environmental interpretation experience (156 subjects), and the experimental group consisted of individuals exposed to the gamified version (158). As the number of cases per group was very similar, there were assumed to be no problematic issues vis-à-vis the distribution of the groups (Uriel, 1995). Regarding the demographic characteristics of the sample, 41% of the participants were male and 59% female; 17% were between 18 and 29 years old, 24% between 30 and 44, 38% between 45 and 65, and 21% over 65. Finally, 57% were employed and 43% unemployed. The sample distribution therefore largely coincided with the general profile of British and American tourists (IndexMundi, 2019a, 2019b; Koema, 2018a, 2018b).

### 3.2. Experiment design

A quasi-experiment with a control group and a post-test measure was designed (Zikmund, 1998). This included a treatment variable (environmental interpretation type) and a dependent variable (CBDBE), with a moderating variable (perceived psychological distance). Quasi-experimental designs offer the advantage of external validity, thus enabling the variables to be manipulated in natural settings, which would otherwise be difficult, if not impossible (Zikmund, 1998). Despite their advantages, quasi-experimental designs so present some challenges because it is difficult to rule out variables other than the independent variables as explanations for the evidence identified. However, every effort was made to do so for the differences observed (see control variables listed in section 3.2.2).

#### 3.2.1. Independent variables

**Type of environmental interpretation.** An environmental interpretation experience delivered in an online format was designed, focusing on one of the phases of the tourist stay only: the pre-stay. This

experienced featured multimedia content combining audio, text and images, in line with the recommendations of Wolf, Stricker, and Hagenloh (2013). To create the content, environmental sustainability guidelines (White, McCrum, Blackstock, & Scott, 2006) and environmental sustainability indicators (Blancas et al., 2015) were adhered-to. The content included practical information on safety and how to act in each location, in accordance with that indicated by Ballantyne, Packer, and Hughes (2009). Those authors found that tourists are more receptive to site-specific messages that include practical information, rather than more general environmental conservation data.

Two alternative environmental interpretation experiences were created: 1) non-gamified (multimedia format only) vs. 2) gamified (multimedia gamification format designed to generate a gameful experience). Care was taken to ensure equivalence between the two versions in the core environmental interpretation service so that they only differed in the design features pertaining to the two formats; other than that distinction, homogeneous information, word-count and images were provided across the two alternatives (Fig. 2).

For the non-gamified version, a multimedia tourism leaflet was chosen as the format, as this is among the most widely-used intervention techniques for promoting more sustainable behavior (Froehlich, 2015, pp. 563–596). The leaflet was divided into three sections, one for each of three types of tourism ('Beaches', 'Historical and Cultural Heritage', and 'Natural Resources'). For the gamified version, this began with a selection of avatars from which the participants could choose. Next, they were shown a map of Spain with icons representing the same three types of tourism. The map was interactive, allowing participants to select the order in which they accessed the three scenarios. By clicking on each one, they were exposed to the corresponding information. They were then able to respond to three questions about what they had read, winning 5 points for every correct answer up to a maximum of 15 points per tourism type and 45 for the whole game. The minimum exposure time for each treatment, including video, was 4 min 8 s (Appendix 2).

**Perceived psychological distance.** As perceived psychological distance was not directly observable, this variable was measured using a survey, given that this is known to be a valid means to capture

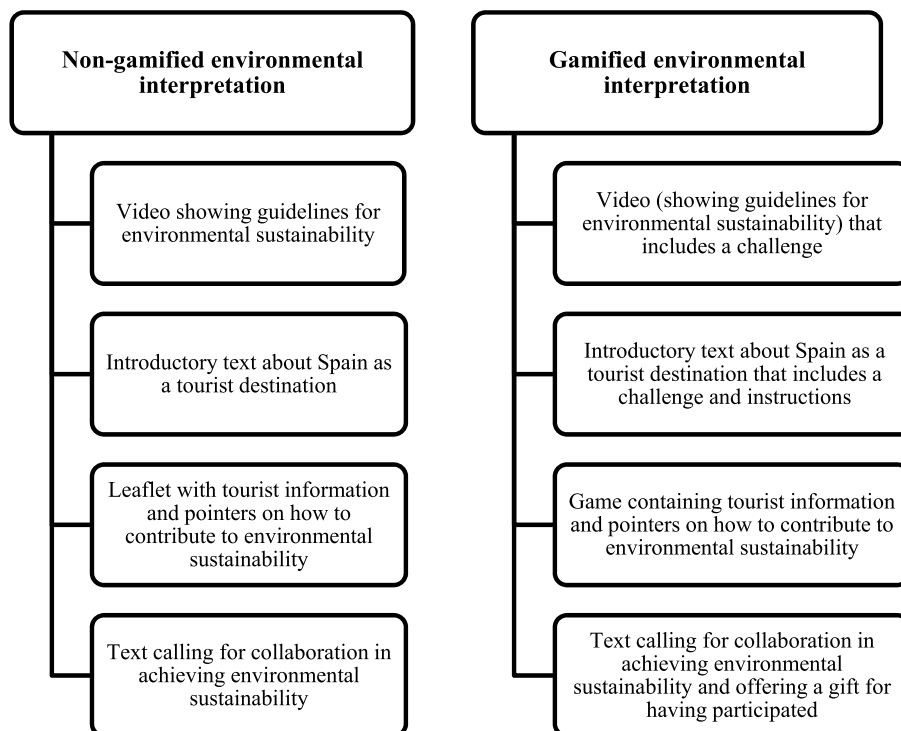


Fig. 2. Structure of non-gamified vs. gamified environmental interpretation experience.

motivations and perceptions (Hernández-Ortega, 2018). Spatial, social, and temporal distance dimensions were all measured on a 2-item, 7-point Likert scale (Appendix 1), as previously used in the literature (Chang et al., 2015; Nenkov, 2012). The scale was validated, presenting adequate validity and reliability values (composite reliability: 0.74; variance extracted: 0.58). On this basis, the scale was recoded using the mean value of the sum of the scale items. At this point, each group of participants in the gamified vs. the non-gamified version was divided in two, according to the median of the variable obtained. The outcome of this process was as follows: 1) Non-gamified environmental interpretation—psychologically near; 2) Non-gamified environmental interpretation—psychologically distant; 3) Gamified environmental interpretation—psychologically near; and 4) Gamified environmental interpretation—psychologically distant.

3.2.2. Dependent variable and other variables

**Dependent variable.** To measure the dependent variable CBDDBE, a 4-item, 7-point Likert scale developed by Yoo and Donthu (2001) was used, this having been applied to the tourism sector in previous studies (Frías Jamilena et al., 2017) (Appendix 1). This overall measure of CBDDBE has a high correlation with other scales that measure this concept based on its dimensions (Frías Jamilena et al., 2017).

**Experimental manipulation check.** To ensure that the factor manipulation was performed correctly, measurements were taken to test whether the gamified environmental interpretation successfully delivered a gameful experience. To measure gameful experience, a scale covering both intrinsic motivation and enjoyment was validated. For intrinsic motivation, the 7-point Likert scales developed by Lieberoth (2015) were used to measure three dimensions: 3 items for autonomy, 5 items for competence, and 3 items for relatedness. Enjoyment was measured on the 7-point, 4-item Likert scale developed by Van der Heijden (2004) and later used by Hamari and Koivisto (2015a) (Appendix 1).

**Control variables.** To correctly relate the factors manipulated in the experiment with the dependent variable, the control variables ‘prior destination image’, ‘environmental concern’ and ‘subjective norms’ (Malhotra, 2010) were employed. The three variables were measured before the subjects were exposed to the treatments, as recommended by some authors (Kirk, 1995). Prior destination image was measured using 4 items on a 7-point semantic differential scale, similar to the approach of other studies (Beerli & Martín, 2004; Frías Jamilena et al., 2017). To measure participants’ environmental concern, 5 items were applied to a 7-point Likert scale, again previously used by other authors (Chang et al., 2015; Kim & Choi, 2005). Finally, subjective norms were measured via 4 items on a 7-point Likert scale, once again as per previous studies (Hamari & Koivisto, 2015b) (Appendix 1).

**Sociodemographic variables.** The last part of the questionnaire gathered a series of sociodemographic variables (including gender, age, and employment status), and established the respondent’s level of experience of electronic games. Four intervals were used to measure age, while the employment measure was coded into two categories, employed and not employed. In line with previous studies (Ibanez, Di-Serio, & Delgado-Kloos, 2014; Liu & Shiue, 2014), the level of experience of computer games was measured on the basis of whether the individual had ever played a game on a computer/a tablet/a mobile phone or not, and, if they responded in the affirmative, how long they had been doing so.

4. Analysis of the results

To test the hypothesis proposed in this research, a variance analysis (ANOVA) was conducted using CBDDBE as the dependent variable and ‘environmental interpretation type’ and ‘psychological distance’ as independent variables. Prior to this, however, the validity and reliability of the scales needed to be validated, and the presence of selection bias in the sample had to be ruled out.

4.1. Scale validation

To test the proposed hypotheses, scale validation was performed for CBDDBE, gameful experience (as a second-order construct comprising four dimensions (autonomy, competence, relatedness, and enjoyment), and the control variables (prior image, environmental concern, and subjective norms) using confirmatory factor analysis (CFA). First, the psychometric properties of the proposed model were evaluated. Since the multivariate normality test of the variables included in the proposed model proved significant, the estimation was best conducted using the maximum likelihood method combined with bootstrapping (Yuan & Hayashi, 2003). Given the high degree of convergent validity (determined through the reliability and validity of the variables, see Table 4) and discriminant validity—since the correlation was not greater than 0.80 (Bagozzi, 1994) and the confidence interval of the estimated coefficient did not include the value “1” (Anderson & Gerbing, 1988)—the value of each of these variables could be calculated based on the sum value of its items (Hair, Black, Babin, & Anderson, 2009, pp. 126–7).

4.2. Sample selection bias

Since, in quasi-experiments, there is no random assignment of subjects to groups, it is imperative to ensure that selection bias does not occur (D’Agostino, 1998). To check for the presence of selection bias in this study, association was analyzed using a series of covariates that, according to the literature, affect environmental interpretation—namely, gender (Ballantyne, Packer, & Falk, 2011; Powell et al., 2009), age (Ballantyne et al., 2011; Cheung & Fok, 2014), and employment status (Cheung & Fok, 2014), together with variables that could affect the results of gamification, primarily, level of experience with electronic games (Ibanez et al., 2014; Liu & Shiue, 2014). Association tests were conducted for the different groups and the covariates (age:  $\chi^2 = 7.977$ ;  $df = 9$ ;  $p$ -value = 0.536; employment:  $\chi^2 = 12.038$ ;  $df = 18$ ;  $p = 0.845$ ; gender:  $\chi^2 = 0.229$ ;  $df = 3$ ;  $p$ -value = 0.973; experience of electronic games:  $\chi^2 = 27.416$ ;  $df = 21$ ;  $p$ -value = 0.157). There were no instances of a significant level being reached. These results affirm the absence of subject selection bias and thus avoid the need to verify the results using other, more complex, techniques (Zanutto, Lu, & Hornik, 2005).

4.3. Manipulation check

To check that the manipulated factor produced the desired effects, an ANOVA was performed to compare the means for that factor. The results showed that the mean differences for gameful experience were significant ( $M_{gamified} = 5.01$ ;  $M_{non-gamified} = 4.73$ ,  $p$ -value  $\leq 0.05$ ).

4.4. Concomitant variables

The effect of the factors on the dependent variable was controlled or

**Table 4**  
Composite reliability and average variance extracted of the measurement scales.

Variable	Composite Reliability	Average Variance Extracted
Gameful experience (second-order construct)	0.76	0.46
Autonomy	0.93	0.83
Competence	0.94	0.77
Relatedness	0.93	0.82
Enjoyment	0.95	0.84
CBDDBE	0.88	0.65
Environmental concern	0.93	0.73
Prior image	0.97	0.89
Subjective norms	0.93	0.78
Goodness-of-fit of the model: Global fit of the model: Normed chi-square = 1.99, RMSEA = 0.08; incremental fit: CFI = 0.92, IFI = 0.92, TLI = 0.92.		



using ‘prior destination image’, ‘environmental concern’, and ‘subjective norms’ as covariates. According to Kirk (1995), the use of a covariate is suitable if it fulfills the following criteria: 1) it is related to the dependent variable and 2) it is not related to the independent variables. To verify the first requirement, the Pearson correlation between each of the three aforementioned variables and the dependent variable, CBDBE, was calculated. The results showed a significant correlation in all cases ( $r_{\text{image}} = 0.475$ ,  $p\text{-value} \leq 0.01$ ;  $r_{\text{environmental concern}} = 0.294$ ,  $p\text{-value} \leq 0.01$ ; and  $r_{\text{subjective norms}} = 0.360$ ,  $p\text{-value} \leq 0.01$ ), hence all covariates met the first criterion. To check the second criterion, an ANOVA was performed for each covariate, using the covariate as the dependent variable and the four different groups of the quasi-experiment as the independent variables, thus: 1) Non-gamified— psychologically near; 2) Non-gamified— psychologically distant; 3) Gamified— psychologically near; and 4) Gamified— psychologically distant. For all three covariates, the results showed a significant relationship between the groups and the covariate (prior image:  $F = 8.85$ ,  $p\text{-value} \leq 0.00$ ; environmental concern:  $F = 8.43$ ,  $p\text{-value} \leq 0.00$ ; subjective norms:  $F = 4.75$ ,  $p\text{-value} \leq 0.00$ ), therefore they did not fulfill the second requirement for being included as covariates.

#### 4.5. Testing the proposed hypotheses

Based on these results, it was deemed appropriate to test the proposed hypotheses via an ANOVA, using CBDBE as the dependent variable and ‘environmental interpretation type’ and ‘psychological distance’ as independent variables.

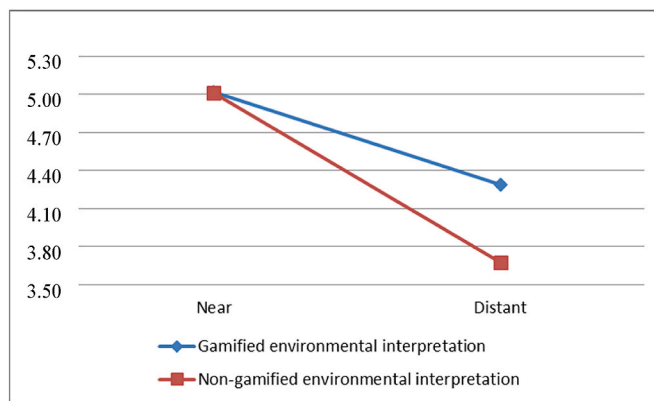
The main effect of environmental interpretation type on CBDBE was significant, the mean for the gamified environmental interpretation experience being greater than the non-gamified version (non-gamified  $M = 4.27$  vs. gamified  $M = 4.65$ ). The difference between the two means was also significant ( $F = 6.22$ ,  $p\text{-value} \leq 0.01$ ) Therefore, H1 finds empirical support H1 (Table 5).

The main effect of psychological distance on CBDBE was also significant, the mean for psychologically near being greater than that for psychologically distant ( $M_{\text{near}} = 5.02$ ;  $M_{\text{distant}} = 3.97$ ); here, too, the difference between the two means was significant ( $F = 54.75$ ,  $p\text{-value} \leq 0.01$ ) Therefore, individuals who perceived the stimulus to be psychologically near gave higher values to CBDBE than those who perceived it to be psychologically distant. H2 therefore obtains empirical support (Table 5).

Finally, in interpreting the main effects, the fact that the interaction between environmental interpretation type and psychological distance is significant (Table 5 and Fig. 3) must be taken into account. H3 proposes that the psychological distance perceived by the participant moderates the effect of environmental interpretation type on CBDBE ( $p \leq 0.05$ ). Tukey’s test was performed, with the results indicating that CBDBE is significantly higher among individuals who perceive psychological distance when exposed to a gamified environmental interpretation experience compared to a non-gamified version ( $p\text{-value} \leq 0.01$ ), which provides empirical support to H3a. However, in this case, Tukey’s test showed that, when the participant perceived psychological

**Table 5**  
Results of ANOVA analyses.

	Sum of squares	Degrees of freedom	Mean squares	F	P-value
Design type of environmental interpretation	11.205	1	11.205	6.22	0.01
Perceived psychological distance	85.58	1	85.58	54.75	0.00
Interpretation type x psychological distance	7.45	1	7.45	4.89	0.02



**Fig. 3.** Interaction effect of environmental interpretation type and psychological distance on CBDBE.

nearness, a gamified environmental interpretation experience does not generate any significant differences in CBDBE values, compared to a non-gamified version ( $p = 0.99$ ). These findings confirm H3b (Fig. 3).

Prior to the ANOVA, the fulfillment of three fundamental conditions was confirmed (Ordaz, Melgar, & Rubio, 2014): 1) independence was fulfilled as this was an inter-subject study; 2) normality was unproblematic since the sample comprised 314 individuals; and 3) homoscedasticity also posed no issue, since the groups were approximately the same size (Uriel, 1995).

## 5. Discussion of the results and conclusions

The primary objective of tourism managers is to maximize the competitiveness of their destinations by implementing branding strategies. One means of achieving this is to improve brand equity (Bastos & Levy, 2012; Pike & Page, 2014). However, in contrast to the past, it is now essential that efforts to achieve greater destination competitiveness be based on strategies that contribute to achieving greater sustainability of the destination and also the achievement of the United Nations Sustainable Development Goals (SDGs) (Gossling et al., 2020; Koens et al., 2020). All such strategies must also take into account the current challenging circumstances generated by the COVID-19 pandemic. In reorienting strategies in this direction, it is a priority to identify those strategies that can reactivate the sector and boost CBDBE. The present study sought to provide original insights into whether the use of ICT-based environmental interpretation—incorporating a gamified design—is a viable strategy for enhancing CBDBE and whether this effect may be modified by tourist psychological distance. From an academic point of view, the study has provided empirical evidence indicating that (a) participation in a gamified environmental interpretation experience does indeed exert a greater effect on CBDBE than in the case of a non-gamified version (for this, a quasi-experiment using two environmental interpretation formats was created: a non-gamified multimedia leaflet format and a gamified one, which not only included game elements but was also carefully designed to create a *gameful* experience); (b) CBDBE is influenced by tourists’ perceived psychological distance from the destination (psychological distance was measured considering the spatial, social, and temporal dimensions and dividing the groups according to perceived psychological distance—near vs. distant); and (c) psychological distance from the destination moderates the effect of environmental interpretation type (gamified vs. non-gamified) on CBDBE.

This research makes several interesting contributions to the literature on CBDBE. First, the results show that the format of the environmental interpretation design has a significant effect on CBDBE (as also found in previous studies). The literature shows continued interest in better understanding whether gamification can be considered a valid

strategy for the competitive improvement of tourist destinations (e.g. [Abou-Shouk & Solliman, 2021](#); [Xu et al., 2016, 2017](#)); and, on this point, the present study enquires into whether the format—gamified vs. non-gamified—influences the outcomes of the environmental interpretation experience ([Ardoin et al., 2015](#)). Gamified environmental interpretation was found to yield better results than the non-gamified version in terms of the CBDDBE variable, which constitutes a new contribution to the literature in the tourist destination context. This finding is consistent with the previous literature that also found this to be the case for other contexts of application and in relation to other consumer behavior variables (e.g. [Hamari & Koivisto, 2014](#); [Xu et al., 2017](#)). These results constitute a step forward in the literature dealing with the question of how to promote sustainable tourism destinations.

This study also considers gamification from the participant's perspective via the measurement of the gameful experience and its effectiveness in achieving a highly relevant variable for tourist destination competitiveness: CBDDBE. Here, the question of how to best measure a 'gameful' experience and which scales to apply ([Eppmann et al., 2018](#); [Högberg, Hamari, & Wästlund, 2019](#); [Koivisto & Hamari, 2019](#); [Leclercq, Poncin, & Hammedi, 2020](#)) remains a topic of interest to the literature. In the present study, a new scale is developed to measure the degree of intrinsic motivation—autonomy, competence, and relatedness—and enjoyment achieved by the participants during the gamified environmental interpretation. It should be remembered that the gameful experience is a complex construct and, consequently, its measurement is necessarily complex also. With that in mind, the contribution of this work constitutes an important step toward the generalization of the measurement of this construct.

The decision to study gamification was based on the link identified by the literature between this approach and improvements in the complete tourist experience ([Xu et al., 2017](#)). Furthermore, this perspective addresses a research gap, in that there is no previous research examining the effects of gamification on the improvement of the tourist experience resulting from environmental interpretation activity, and more research is required on the use of ICTs in this educational tool ([Tan & Law, 2016](#)). The rationale for analyzing perceived psychological distance is that it is known to exert a fundamental influence on the decisions and assessments that individuals make ([Liberman et al., 2007](#); [Trope et al., 2007](#)). Until now, no studies have captured prior data on the effects of psychological distance on the environmental interpretation format.

Second, the results show that tourists who perceive the destination to be psychologically distant deliver inferior results in terms of CBDDBE, meaning that the environmental interpretation experience will be less effective among tourists with this profile. These are new findings in relation to CBDDBE and are in line with previous studies that note a correlation between psychological nearness and greater effectiveness of marketing actions based on other consumer behavior variables such as trust and purchase intention ([Darke et al., 2016](#)), brand preference and use ([Lii et al., 2013](#)), or value co-creation ([Holmqvist, Guest, & Grönroos, 2015](#)). This points to the need to identify more effective strategies particularly aimed at tourists who feel psychologically distant from the destination—a need that provides the basis for the final contribution of the study, outlined next.

Finally, the results confirmed the moderating effect of perceived psychological distance on the relationship between gamification and CBDDBE. Again, in a new finding, the study identified that, when the individual perceives the destination to be psychologically distant, a gamified environmental interpretation experience generates significantly higher CBDDBE than the non-gamified version. However, when they perceive it to be psychologically near, there are no significant differences in CBDDBE between the gamified and non-gamified versions. This can be explained by the fact that the core service provided by the environmental interpretation is the same in both cases ([Huotari & Hamari, 2012](#)). This result confirms the existence of a regulatory construal fit, and gamification is therefore recommended as an effective strategy for targeting tourists who perceive the destination as being

psychologically distant, which is especially relevant considering that they presented worse results in the CBDDBE. Furthermore, the results demonstrate the effectiveness of gamification for both types of tourists (psychologically near vs. distant). These results add a valuable dimension to the many extant studies that show the importance of fit between the stimulus and the individual's mind ([Chou & Lien, 2012](#)). They also constitute a further step toward a fuller understanding of the efficacy of the use of gamification, which is of particular interest to the specialist gamification literature ([Hamari et al., 2014](#); [Koivisto & Hamari, 2019](#); [Seaborn & Fels, 2015](#)). The present study demonstrates its effectiveness in relation to the behavior of potential tourists in destinations with an international profile.

The present research is relevant to the literature dealing with gamification, psychological distance, and the possibilities of regulatory construal fit, as it proposes a novel research model that jointly studies the potential for a fit between both the factors that shape the environmental interpretation experience (gamified vs. non-gamified) and also those affecting the participants (psychologically near vs. distant). The present analysis, which builds on the previous contributions to the literature, successfully associates a gamified environmental interpretation experience (promotion focus and high construal level) with a non-gamified environmental interpretation experience (prevention focus and low construal level). The evaluation of both scenarios, based on an empirical study and a quasi-experimental design (in which participation in a gamified environmental interpretation vs. a non-gamified version was manipulated and the subjects were self-classified according to their psychological distance from the destination), provided empirical evidence of a regulatory construal fit that leads to greater effectiveness of the environmental interpretation experience in terms of its impact on CBDDBE. While the literature has pointed to the need to study how the fit of one type of interpretation vs. another may be determined by the characteristics of participants (e.g. [Ballantyne et al., 2018](#); [Kim, 2012](#); [Powell et al., 2009](#)), this can be considered an original contribution as no previous study, as far as could be determined, has jointly analyzed the factors that influence the interpretation experience itself (gamified vs. non-gamified) and those that affect the participants (psychologically near vs. distant), together with the potential fit between them.

## 6. Practical implications, limitations and future research directions

From a practical point of view, the results have several implications for both public and private entities, as well as for travel agencies, not least in contributing to the efforts toward achieving the SDGs and revitalizing a sector so gravely affected by the COVID-19 pandemic. The present study demonstrates, in particular, the effectiveness of environmental interpretation delivered via gamified online media in the pre-stay phase, which is critical to tourist decision-making as COVID-19 restrictions start to be lifted. Tourist destinations can improve the experience of potential tourists in the pre-stay phase by offering this gamified experience. This is an effective strategy for increasing CBDDBE while promoting the environmental conservation of the destination. Both objectives are fundamental for many mature tourist destinations (such as in the case of Spain) in continuing to attract tourists over the medium-long term.

In the pre-stay phase, information-search is critical to tourists' decision to opt for one destination over another. In this regard, the possibilities offered by ICTs have altered not only how people find information about destinations and make their travel purchases but also how they experience, communicate and perceive destinations ([Agapito & Lacerda, 2014](#)). Although environmental interpretation tends to obtain superior results when it involves interaction with tour guides ([Ballantyne et al., 2009](#); [Coghlan et al., 2011](#); [Coghlan & Kim, 2012](#)), gamification enables tourists to explore the destination in an innovative, interactive and personalized way ([Xu et al., 2016](#)). It also makes a greater impact in the online environment ([Hsu, Chen, Yang, & Lin,](#)

2017), which can help mitigate the absence of the typical interaction with tour-guides that is characteristic of traditional environmental interpretation. Based on the above, and in light of the results of the present work, it is suggested that one way for tourism firms and those responsible for tourist destinations to improve destination competitiveness is to implement a gamified environmental interpretation experience. The gamification can be delivered via online media and has the potential to generate motivation and enjoyment among participants that, in turn, will produce greater destination brand equity.

With regard to the design of the gamified environmental interpretation, the results of this study also provide valuable insights to managers and other sector professionals. As firms are increasingly showing interest in the uses of gamification to achieve various objectives linked to consumer behavior, it is important to pay attention to its design. However, this should not be merely limited to game-like elements or focus exclusively on systemic design features (Huotari & Hamari, 2017). Rather, the design process must consider the specific objectives the gamification needs to fulfill and the context in which it will be applied—that is, the gamification elements need to employ the appropriate affordances that lead the consumer to enjoy a gameful experience, as was achieved in the case of the gamified environmental interpretation used in this work. Here, the priority was to (i) adopt a holistic perspective of gamification, giving careful thought to which game elements to build into the design to optimize its *experiential* dimension, (ii) evaluate the suitability of the objectives to be achieved via gamification, and (iii) design a combination of challenges, affordances, and rules that would motivate participants to learn about how to improve the sustainability of a tourist destination while *enjoying* that participation. It is also important to evaluate the outcomes of the gamification to discern whether it has proved successful and is capable of producing the desired effects on consumer behavior variables. Hence, if tourism-sector business owners are seeking to test the suitability of the gamification strategy they have implemented, they should start by evaluating the variables of intrinsic motivation (autonomy, competence, and relatedness) and enjoyment among the participants, as the present study demonstrates. The scale proposed here can be used by sector professionals to test the gameful experience and the suitability of the gamification design.

Finally, destination managers need to adapt their market-oriented strategies according to consumers' psychological distance. This is a particularly critical aspect when one considers the international nature of tourism and the need to appeal to diverse target audiences. Given that the greater the psychological distance, the more the effectiveness of marketing actions may suffer, valid strategies need to be identified for reaching those tourists who perceive the destination to be psychologically distant. In this scenario, it is useful to know that the use of gamification (in this case applied to environmental interpretation) has been found to be an effective strategy to target tourists who, based on their perceptions, feel psychologically distant from the destination, given its positive impact in terms of higher CBDBE values. The use of gamification was also found to be effective among tourists who perceive the destination to be psychologically near. In this collective, both gamified and non-gamified environmental interpretation types are equally effective in terms of CBDBE. In this case, managers can opt for either strategy. Overall, the results of this study suggest that managers and professionals in the tourism sector will find that gamified environmental interpretation is especially effective among tourists who perceive the destination to be psychologically distant, but it also works well for those who perceive the destination as near. All in all, it is a highly-recommendable strategy that addresses the different preferences that the international tourist market may present (based on the perceived psychological distance of the destination), and that is also well-aligned

with the possibilities offered by the Internet to access a globalized market.

### 6.1. Limitations and future research directions

Like all research, the present study is shaped by certain limitations that could be addressed in future research. First, although a tourist destination that is recognized for its leading position in incoming international tourism was selected, it would be interesting to replicate this study to determine whether the use of environmental interpretation is effective in different mature tourist destinations that do not specialize in nature tourism. Regarding the present sample of international tourists and the psychological distance they perceived relative to the tourist destination (Spain), it would be valuable for future studies to use samples of tourists of other nationalities or conduct research in different tourist destinations, as this could lend further solidity to the present results and render them more generalizable. It could also be of value to compare the effectiveness of the gamified environmental interpretation strategy with respect to domestic tourists.

Second, other future research directions could include different factors that may affect environmental interpretation and its outcomes, such as cultural differences among tourists. This research could also be performed in other phases of the tourist experience—during the stay and post-stay—in which different factors would play a role.

Third, it would be interesting to consider how the different characteristics of consumers (such as profiles of origin, languages, culture, motivation, or prior destination experience, among others) may affect destination brand equity. Other relevant variables associated with the gameful experience and consumer behavior could also be examined, and these would need to be linked to the actions that tourism destinations could implement to improve their performance while simultaneously improving their sustainability.

Finally, a particularly relevant research focus at present is that of the consequences of the COVID-19 pandemic. It would be of interest to make advances in the study of the effectiveness of gamified environmental interpretation in terms of certain variables that are particularly critical for tourist destinations at present. These include the adoption of behaviors aimed at improving perceived safety at the destination in extraordinary circumstances, such as the current health crisis generated by COVID-19.

### Credit author statement

María Lina Fernández-Ruano: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data curation, Writing – original draft, Visualization. Dolores M. Frías-Jamilena: Conceptualization, Methodology, Formal analysis, Investigation, Data curation, Writing – review & editing, Supervision. Ana I. Polo-Peña: Conceptualization, Methodology, Software, Formal analysis, Writing – review & editing, Supervision. Francisco Peco Torres: Conceptualization, Methodology, Software, Formal analysis, Investigation, Data curation, Visualization.

### Declaration of competing interest

The authors declare that they have no conflict of interest.

### Acknowledgements

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## Appendix 1

Measurement scales for the variables.

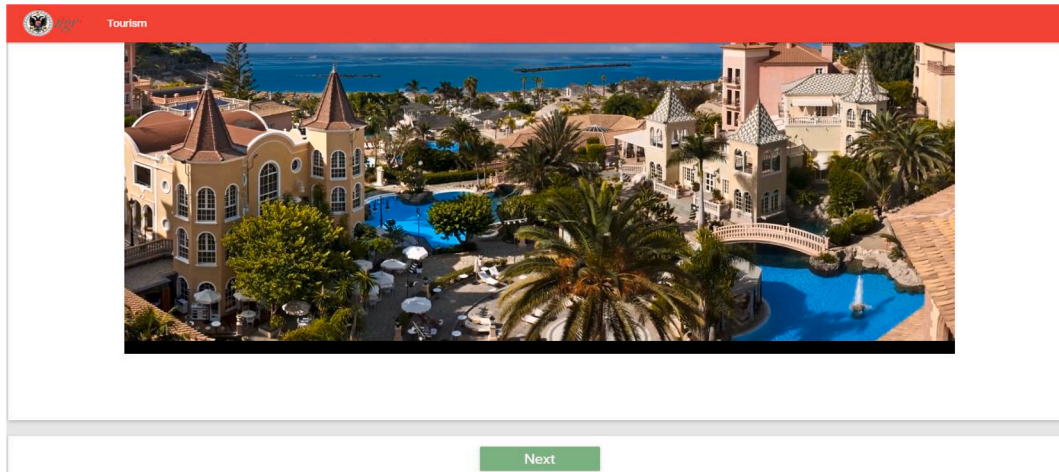
Construct name and source	Indicator	Survey item
Prior destination image (Beerli & Martín, 2004; Frías-Jamilena, Rodríguez-Molina, & Castañeda-García, 2008)	IMAP1	In general, the opinion you have of Spain is: Bad—Good
	IMAP2	In general, the opinion you have of Spain is: Unfavorable—Favorable
	IMAP3	In general, the opinion you have of Spain is: Negative—Positive
	IMAP4	In general, the opinion you have of Spain is: Such that you don't like it—Such that you like it
Environmental concern (Chang et al., 2015; Kim & Choi, 2005)	ENVC1	I am extremely worried about the state of the world's environment and what it will mean for my future
	ENVC2	Mankind is severely abusing the environment
	ENVC3	When humans interfere with nature it often produces disastrous consequences
	ENVC4	The balance of nature is very delicate and easily disrupted
	ENVC5	Humans must live in harmony with nature in order to survive
Subjective norms (Hamari & Koivisto, 2015b)	SUBN1	People who influence my attitudes would recommend treating the environment with respect when I visit a different country
	SUBN2	People who are important to me would think positively of me if I were to treat the environment with respect when I visit a different country
	SUBN3	People who I appreciate would encourage me to treat the environment with respect when I visit a different country
	SUBN4	My friends would think my treating the environment with respect when visiting a different country is a good idea
Perceived psychological distance (Chang et al., 2015; Nenkov, 2012)	CDESP1	You felt that the environmental interpretation was referring to: A place far from home—A place close to home
	CDESP2	You felt like you would be traveling to: A place far from home—A place close to home
	CDTEM1	You felt that the environmental interpretation would be relevant to you: In the distant future—In the near future
	CDTEM2	You felt that you would take the trip: In the distant future—In the near future
	CDSOC1	You felt that the environmental interpretation: Had nothing to do with you—Had everything to do with you
	CDSOC2	You felt that the trip: Would be undertaken by someone else—Would be undertaken by you
Autonomy (IMI & Inventory, 1994; Lieberoth, 2015)	AUT1	I felt that I was doing this activity because I wanted to
	AUT2	I believe I had some choice about doing this activity
	AUT3	I felt like it was my own choice to do this activity
Competence (IMI & Inventory, 1994; Lieberoth, 2015)	COM1	I think I am pretty good at this activity
	COM2	I think I did pretty well at this activity, compared to other participants
	COM3	After working on this activity for a while, I felt pretty competent
	COM4	I am satisfied with my performance in this task
	COM5	I was pretty skilled at this activity
Relatedness (IMI & Inventory, 1994; Lieberoth, 2015)	REL1	I had the opportunity to compete and interact with others
	REL2	I felt I had the opportunity to share my experience with others
	REL3	I had the opportunity to share my achievements with others
Enjoyment (Hamari & Koivisto, 2015a; Van der Heijden, 2004)	ENJ1	I find the environmental interpretation enjoyable
	ENJ2	I find the environmental interpretation pleasant
	ENJ3	I find the environmental interpretation exciting
	ENJ4	I find the environmental interpretation interesting
Destination brand equity (Frías Jamilena et al., 2017)	DBE1	It makes sense to choose this destination rather than another one, even if they are similar.
	DBE2	Even if there is another destination with the same characteristics, I prefer this one.
	DBE3	Even if there is another destination as good as this one, I still prefer this one.
	DBE4	Even if there is another destination, no different from this one, it still seems more intelligent to choose this one.

## Appendix 2

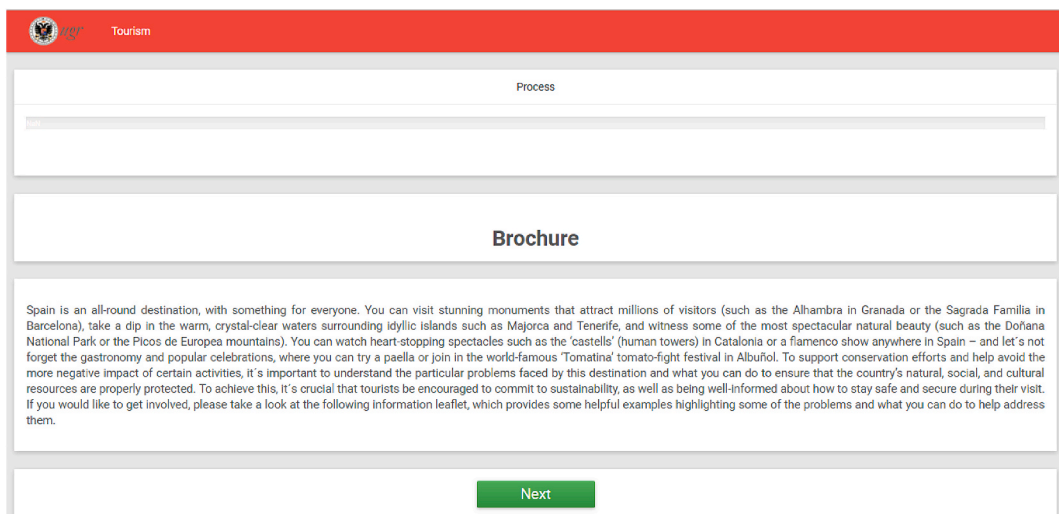
### Experimental stimuli

Non-gamified environmental interpretation experience:

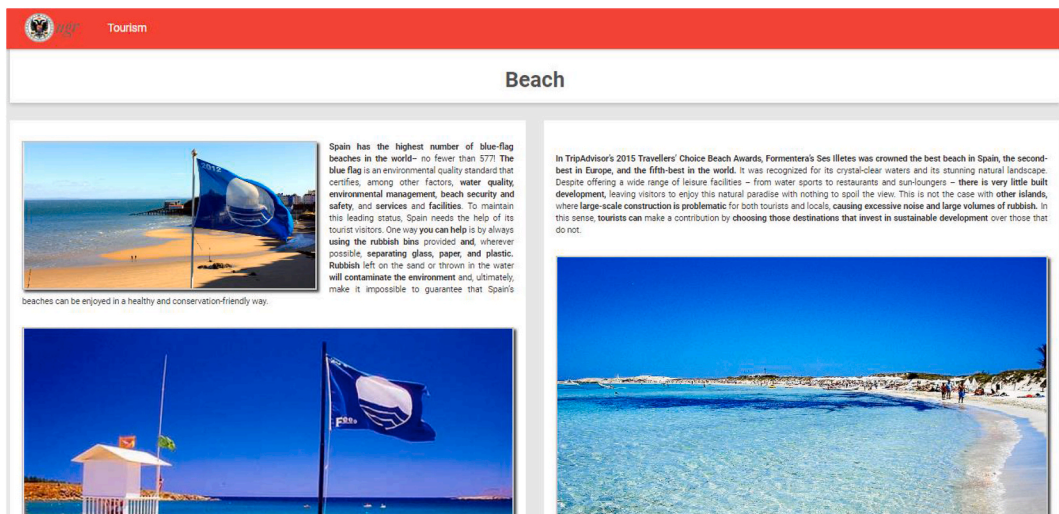







Video showing guidelines for environmental sustainability: <https://www.youtube.com/watch?v=JiOQop7TRwg>.  
Introductory text about Spain as a tourist destination.



Leaflet with tourist information and pointers on how to contribute to environmental sustainability.

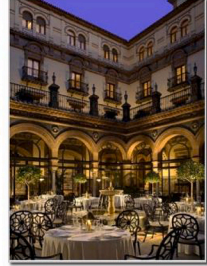


 Tourism





Tourists visiting Spain will find iconic hotels that tell something of the country's history and exude the essence of its customs and culture. But visitors can also find hotels that will provide an exotic experience that transports them to another world. Staying at a hotel is a safe and comfortable option for tourists, but to minimize any negative impact of tourism on the destination it's important to follow recommendations on sustainable management of water supplies.

Encouraging clients to get involved in this effort is a highly effective and successful means for hotels to make a contribution. For example, if hotel clients leave their bath tap running unnecessarily or if they demand their towels and bed linen be changed too often, this level of water consumption is not sustainable. And we all know that this will lead to increasing wastage of this vital resource that is in short supply in certain areas.



**Next**

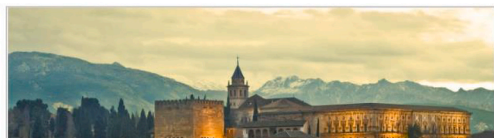
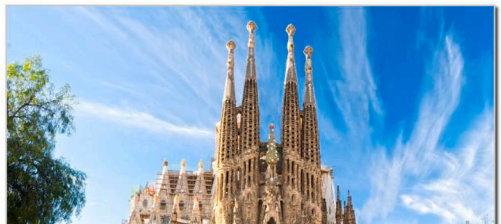
 Tourism

Process

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## Historical and Cultural heritage

**Granada's Alhambra** is a World Heritage Site and the only remaining palatine city from the Islamic era in the world. It houses, among other treasures, the Palace of Charles V, the Royal Palace, the Comares Palace, the Hall of the Kings, the Hall of the Two Sisters, the Courtyard of the Lions, and the Alcazaba fortification. All these features make the Alhambra one of the most-visited monuments in the world. To ensure its safekeeping and also the safety and security of its visitors, certain areas have limited access and visitors have to follow a schedule of timed visits. Were such measures not taken, future generations would not be able to enjoy this unique gem. Again, tourists can help by cooperating fully, for example by respecting the visiting times noted on their entry ticket.

**The Basílica de la Sagrada Família** (Basilica of the Holy Family) in Barcelona is an architectural jewel, crafted by the genius Antoni Gaudí. It is a singularly beautiful construction, known for its outstanding colours and use of light. It is considered a major spiritual centre and is one of the most-visited monuments in Spain (indeed, in the world). It is the city's emblem and one of the features that most impresses visitors. On the downside, tourists find the noise level in Barcelona the most negative feature. In the area surrounding the Sagrada Família, noise pollution is excessive, and the tourists themselves contribute to the general noise level in the city. If the tourists is not civically-minded and respectful in their attitude, for example when visiting public places, the noise level will continue to be one of the least favourable aspects of this wonderful city.

**The Prado Museum in Madrid** is known the world over, and, together with the Thyssen-Bornemisza Museum and the National Reina Sofía Museum, forms the so-called Golden Triangle of Art. Located close by, the three museums, between them, attract millions of tourists each year. The Prado houses the best and most extensive collections of painters such as Velázquez, Goya, and El Bosco. In addition, it not only employs security measures that ensure the wellbeing of all its visitors and the safe-keeping of its artworks, but also makes an active commitment to the environment. In a pioneering move, it has installed LED lighting, which both provides better lighting for the exhibitions and also reduces CO2 emissions. Tourists can also contribute to such environmental initiatives, for example by carefully choosing the best mode of transport for their visit. Unsustainable forms of transport increase CO2 emissions (indeed, they are one of the main causes). Tourists can, however, choose to opt for public transport or are even recommended to discover the city by bike.



**Next**


**Tourism**


Process

---


### Natural Resources

**The Pyrenees**, the mountain range in the north of Spain, offers an **extraordinary natural setting**, with its 'ibóns' – glacial mountain lakes. With around 200 such lakes to choose from, visitors can enjoy a number of sporting activities, including, in particular, ice diving. However, the Pyrenean 'ibóns' are suffering continual damage as a result of the actions of humans. The rubbish that is discarded around the area, or thrown directly into the water, not only presents a **menace for divers** in terms of potential accidents, but also poses a **serious threat to the ecosystem**. Safety measures include a warning not to dive under layers of ice less than 20cm thick, and a request to visitors to take care of this wonderful place and **not leave their rubbish**, as it could be potentially hazardous.







**Tourism**




The **Doñana National Park** is Europe's largest area of natural biodiversity. Thanks to its privileged geographical location between two continents, Doñana is home to **over 300 species of birds** and **37 species of mammals**, notably the Iberian lynx – considered to be the **most at-risk feline species on the planet**. It inhabits the few areas that remain well-conserved and at a safe distance from human activity. Its loss of habitat can be attributed to such catastrophes as forest fires or urban development of the natural environment. Therefore, if visitors to the Park **ignore the recommendations** (for example, if they do not follow the official paths on foot or in specially authorized vehicles), their **safety cannot be guaranteed** and they will be putting the habitat of this unique, beautiful animal at great risk.



Over 25% of Spain is officially protected territory, under the classification system for National Parks and Nature Parks. Of the two, National Parks are more strictly protected by law. Here you can find a diverse range of attractive natural features, including glacial lakes, green valleys, leafy glades, and waterfalls. One of the most popular such parks is **Timanfaya National Park**, in Lanzarote, where over 25 volcanoes are to be found. Visitors must be sure not to miss the volcano route and marvel at the spectacular geysers – but they must always be mindful of the treacherous nature of the Park. To avoid risk wherever possible, and to take good care of this environment, visitors are recommended to **use only the two official paths designated for walkers**, and to cover the rest of the terrain in the company of expert guides, either on foot or by bus – or on camelback, even more fun!






Next

Text calling for collaboration in achieving environmental sustainability.

## Congratulations!

We hope you will collaborate in contributing to the sustainability of this tourist destination. Showing your commitment to the environment as a tourist is entirely in your hands.

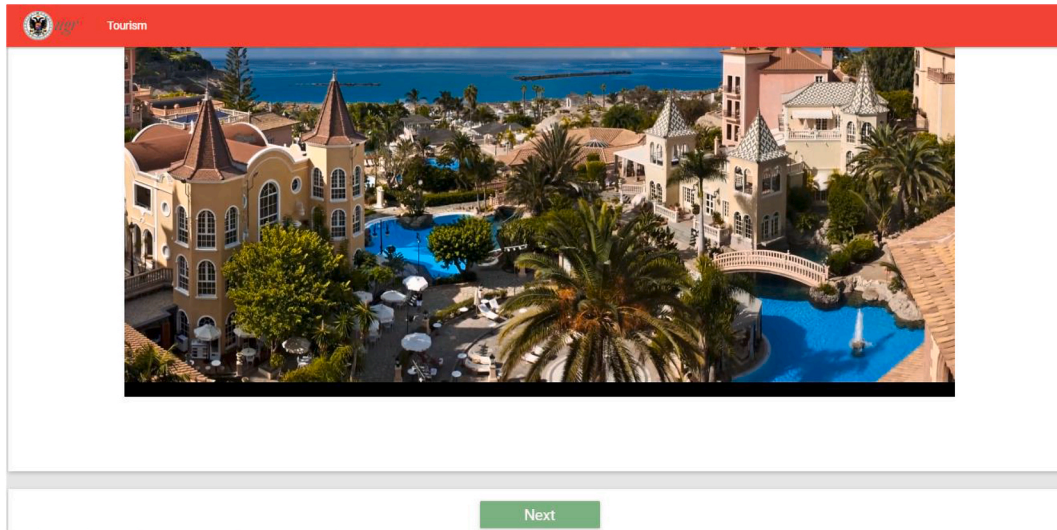


Finalize

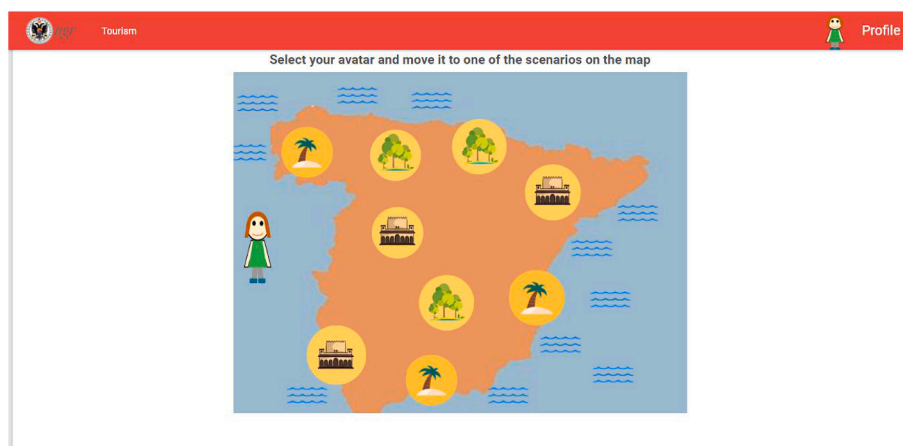
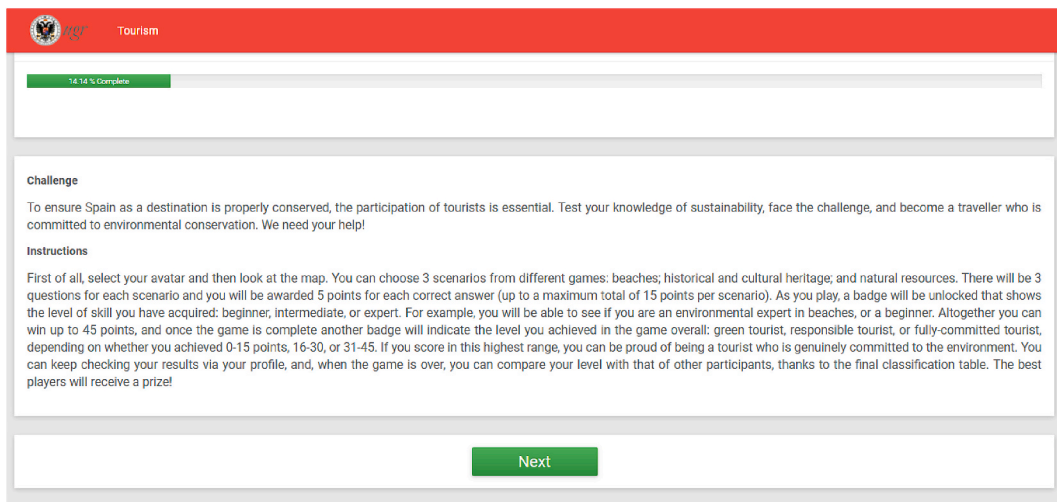


**Gamified environmental interpretation experience.**

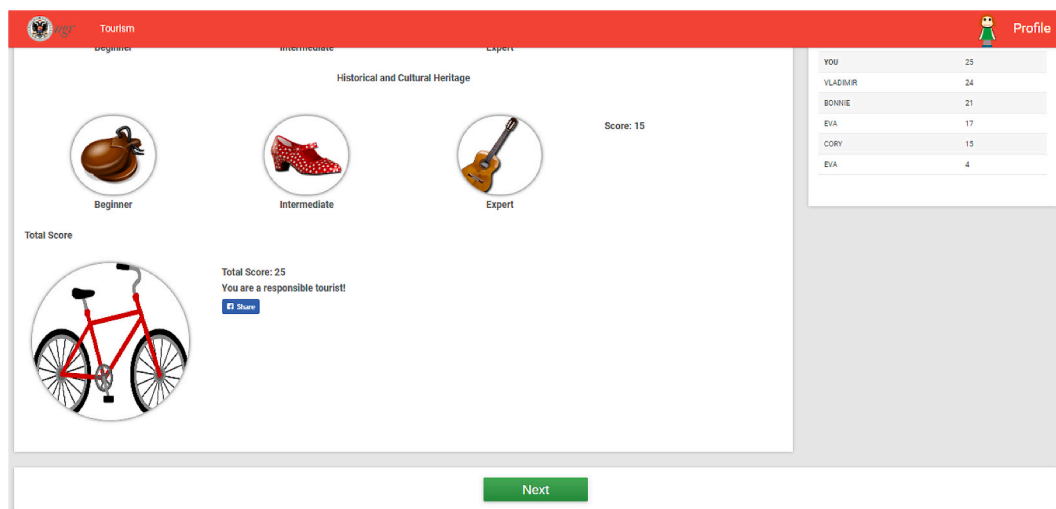
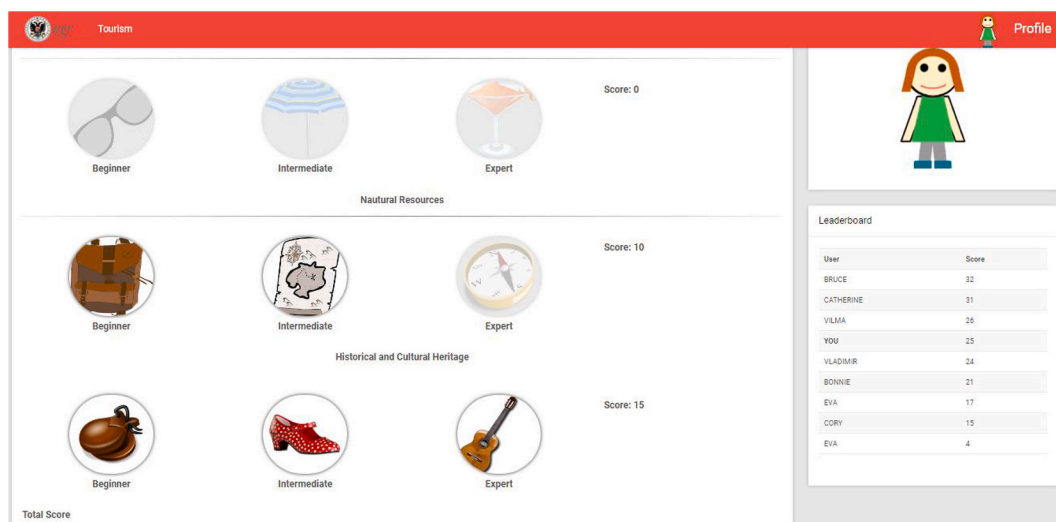
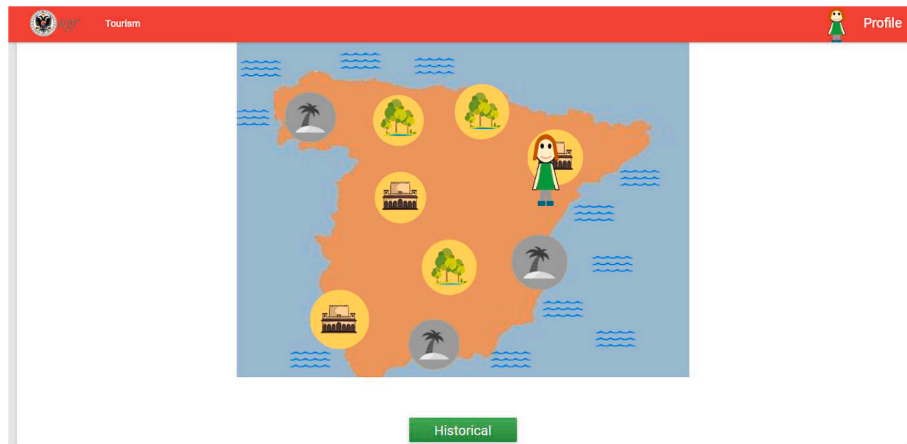
Video (showing guidelines for environmental sustainability) that includes a challenge: <https://www.youtube.com/watch?v=ZPNAppDYGBE>.



Introductory text about Spain as a tourist destination that includes a challenge and instructions, avatar, map to travel and information panel.







Game containing tourist information and pointers on how to contribute to environmental sustainability.

Tourism Profile

Scores


Beginner Intermediate Expert

Total Score: 0

**1 Question**

Spain has the highest number of blue-flag beaches in the world – no fewer than 577! The blue flag is an environmental quality standard that certifies, among other factors, water quality, environmental management, beach safety and security, and services and facilities. To maintain this leading status, Spain needs the help of its tourist visitors. One way you can help is by:

- Always using the rubbish bins provided
- Whenever possible, separating glass, paper, and plastic
- Using the rubbish bins provided (but there is no need to separate-out the glass, paper, and plastic items)
- a and b are the correct answers



Tourism Profile

Scores


Beginner Intermediate Expert

Total Score: 0

**2 Question**

In TripAdvisor's 2015 Travellers' Choice Beach Awards, Formentera's Ses Illetes was crowned the best beach in Spain, the second-best in Europe, and the fifth-best in the world. It was recognized for its crystal-clear waters and its stunning natural landscape. Despite offering a wide range of leisure facilities – from water sports to restaurants and sun-loungers – there is very little built development. This is not the case with other islands, where large-scale construction is problematic for both tourists and locals, causing excessive noise and large volumes of rubbish. How can tourists encourage more sustainable construction?

- By staying only at apartments
- By rewarding those destinations investing in sustainable construction with their business, choosing these destinations for their visit
- Tourists cannot make any such contribution
- None of the above.



Tourism Profile

Scores

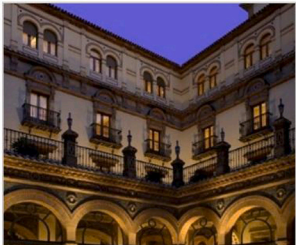
Beginner Intermediate Expert

Total Score: 0

**3 Question**

Tourists visiting Spain will find iconic hotels that tell something of the country's history and exude the essence of its customs and culture. But visitors can also find hotels that will provide an exotic experience that transports them to another world. Staying at a hotel is a safe and comfortable option for tourists, but to minimize any negative impact of tourism on the destination it's important to follow recommendations on sustainable management of water supplies. Encouraging clients to get involved in this effort is a highly effective and successful means for hotels to make a contribution. How can clients ensure their water consumption is sustainable and avoid wasting water – a vital resource that is in short supply?

- By turning off the tap when not in use
- By not demanding their towels be changed unnecessarily
- By not demanding their bed linen be changed, if not strictly needed
- All of the above



Tourism
 Profile

Beginner

Intermediate

Expert

**Scores**

Total Score: 0

**1 Question**

Granada's Alhambra is a World Heritage Site and the only remaining palatine city from the Islamic era in the world. It houses, among other treasures, the Palace of Charles V; the Royal Palace; the Comares Palace; the Courtyard of the Lions; and the Alcazaba fortification. All these features make the Alhambra one of the most-visited monuments in the world. What guidelines should be followed in order to ensure its safekeeping and also the safety and security of its visitors, so that future generations can continue to enjoy it?

Set a visiting schedule (but without a time limit, once inside)

Just place a limit on length of visits

The tourist must keep to the timings indicated on their entry ticket

Only public bodies can support its conservation

Tourism
 Profile

Beginner

Intermediate

Expert

**Scores**

Total Score: 5

**2 Question**

The Basílica de la Sagrada Família (Basilica of the Holy Family) in Barcelona is an architectural jewel, crafted by the genius Antonio Gaudí. It is a singularly beautiful construction, known for its outstanding colours and use of light. It is considered a major spiritual centre and is one of the most-visited monuments in Spain (indeed, in the world). It is the city's emblem and one of the features that most impresses visitors. On the downside, tourists find the noise level in Barcelona the most negative feature. In the area surrounding the Sagrada Família, noise pollution is excessive. Given that the tourists themselves contribute to the general noise level in the city, what can they do to reduce the level and thus help ensure that this issue ceases to attract among the worst ratings?

Speak quietly during their stay in the city

Be civically-minded and respectful in their attitude when visiting public places

Not listen to music

None of the above

Tourism
 Profile

Beginner

Intermediate

Expert

**Scores**

Total Score: 10

**3 Question**

The Prado Museum in Madrid is known the world over, and, together with the Thyssen-Bornemisza Museum and the National Reina Sofía Museum, forms the so-called Golden Triangle of Art. Located close by the three museums, between them, attract millions of tourists each year. The Prado houses the best and most extensive collections of painters such as Velázquez, Goya and El Bosco. In addition, it not only employs security measures that ensure the wellbeing of all its visitors and the safekeeping of its artworks, but also makes an active commitment to the environment. In a pioneering move, it has installed LED lighting, which both provides better lighting for the exhibitions and also reduces CO2. How can tourists contribute to this environmental initiative and help reduce CO2 emissions? Bearing in mind that transport is one of the main causes of carbon emissions, tourists could:

Travel around the city by bike

Opt for public transport

Take the bus rather than the car

All of the above

Tourism
 Profile

Scores

Beginner

Intermediate

Expert

Total Score: 0

**1 Question**

The Pyrenees, the mountain range in the north of Spain, offers an extraordinary natural setting, with its 'ibóns' – glacial mountain lakes. With around 200 such lakes to choose from, visitors can enjoy a number of sporting activities, including in particular ice diving. However, the Pyrenean 'ibóns' are suffering continual damage as a result of the actions of humans – actions that can also cause accidents among divers. To reduce the likelihood of such risk, divers are recommended not to dive under layers of ice less than 20cm thick. But, in addition, to protect the wider ecosystem, what should visitors do?

> Avoid discarding rubbish in or around the water

> Use the lakes for fishing

> a and b are both correct

> Discarded rubbish poses no threat of danger to divers

Tourism
 Profile

Scores

Beginner

Intermediate

Expert

Total Score: 0

**2 Question**

The Doñana National Park is Europe's largest area of natural biodiversity. It is home to over 300 species of birds and 37 species of mammals, notably the Iberian lynx – considered to be the most at-risk feline species on the planet. It inhabits the few areas that remain well-conserved and at a safe distance from human activity. Its loss of habitat can be attributed to such catastrophes as forest fires or urban development of the natural environment. To avoid putting the habitat of this unique animal at great risk, and to ensure visitor safety, what are the recommendations?

> Other than not making fires, there are no further measures that need to be taken

> Visit the park on foot, using the official pathways

> Visit the park using authorized vehicles belonging to the specialist companies operating there

> b and c are correct

Tourism
 Profile

Scores

Beginner

Intermediate

Expert

Total Score: 5

**3 Question**

Over 25% of Spain is officially protected territory, under the classification system for National Parks and Nature Parks. Of the two, National Parks are more strictly protected by law. Here you can find a diverse range of attractive natural features, including glacial lakes, green valleys, leafy glades, and waterfalls. One of the most popular such parks is Timanfaya National Park, in Lanzarote, where over 25 volcanoes are to be found. Visitors must be sure not to miss the volcano route and marvel at the spectacular geysers – but they must always be mindful of the treacherous nature of the Park. To avoid risk wherever possible, and to take good care of this environment, visitors are recommended to explore the Park:

> In the company of expert guides

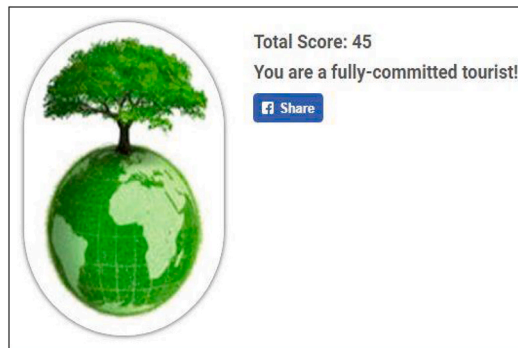
> Using the official paths

> By camel, on trips organized by specialist companies

> All the above

Text calling for collaboration in achieving environmental sustainability and offering a gift for having participated.





Congratulations, you completed the game!

Congratulations! You completed the game! Showing your commitment to the environment as a tourist is entirely in your hands.

Follow the link to get your prize!! [Click here.](#)

Please after downloading the guide, finish the survey on this page so you could be redirected to your panel's points page, thanks

Finalize

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