The Role of Gamified Environmental Interpretation in Boosting Destination Perceived Value

La contribución de la interpretación ambiental gamificada en la formación del valor percibido de un destino

Ana Isabel Polo Peña
Universidad de Granada, Facultad de Ciencias Económicas y Empresariales, Dpto. Comercialización e Investigación de Mercados, España, apolo@ugr.es

María Lina Fernández Ruano
Universidad de Granada, Facultad de Ciencias Económicas y Empresariales, Comercialización e Investigación de Mercados, España, mlinaferrua@ugr.es

Dolores María Frías Jamilena
Universidad de Granada, Facultad de Ciencias Económicas y Empresariales, Dpto. Comercialización e Investigación de Mercados, España, dfrias@ugr.es

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Abstract

This study examines the effectiveness of a strategy designed to enhance destination perceived value (PV) by raising tourists' awareness and understanding of sustainability. The approach uses information and communications technologies—specifically, gamification—to design an environmental interpretation (EI) program for tourists. While the literature has tended to approach gamification from a *systemic* perspective, this study addresses a significant gap by adding the *experiential* dimension. The research (a) designs an EI program based on a holistic gamified approach that takes game objectives, features, the context of the application, and the participant experience into consideration; (b) measures the tourist's perspective on the design to test whether it successfully generated a motivating and enjoyable (gameful) experience that could positively impact their behaviours; and (c) determines whether a gameful EI experience positively influences destination PV. The results show that the proposed strategy contributes to enhancing destination PV. The gamification of EI experiences is thus found to be a valid strategy for enhancing destination sustainability, tourist behaviours, and, ultimately, destination competitiveness.

Keywords: Gamification, Sustainability, Environmental Interpretation, Holistic Design, Perceived Value, ITCs.

Resumen

Este estudio examina la efectividad de una estrategia para mejorar el valor percibido (PV) del destino mediante el aumento de la conciencia y la comprensión de la sostenibilidad entre los turistas. Se implementa implementa un programa de interpretación ambiental (IA) para turistas con gamificación y sobre tecnologías de la información y la comunicación. La literatura ha abordado la gamificación desde una perspectiva sistémica, a partir de la que en este trabajo se agrega la perspectiva experiencial. La investigación (a) diseña un programa de IA basado en un enfoque gamificado holístico que toma en consideración los objetivos del juego, las características, el contexto de la aplicación y la experiencia del participante; (b) mide la perspectiva del turista sobre el diseño para probar si generó exitosamente una experiencia (*gameful*) motivadora y divertida que podría afectar positivamente sus comportamientos; y (c) determina si una experiencia *gameful* influye positivamente en el VP del destino. Los resultados muestran que la estrategia propuesta contribuye a mejorar el VP del destino. Por lo tanto, se considera que la estrategia de gamificación de la IA es una válida para mejorar la sostenibilidad del destino, el comportamiento de los turístas y, en última instancia, la competitividad del destino.

Palabras clave: Gamificación, Sostenibilidad, Interpretación Ambiental, Diseño Holístico, Valor Percibido, TICs.

1. Introduction

Tourist destinations are under increasing pressure to develop strategies for building competitiveness in the market (Frías-Jamilena et al., 2017). In this regard, perceived value is regarded to be a representative variable of tourist behaviour (e.g., Baker & Fulford, 2016; Oviedo-García et al., 2017) and is also a significant indicator of the level of conservation of the destination's resources (Ahn & Kwon, 2020; Polo-Peña et al., 2013). Researchers and sector professionals alike are keen to identify actions that can help alleviate the detrimental consequences of the tourist's interactions with their destination of choice (Yenidogan et al., 2021; Oviedo-García et al., 2017) and that are reflected in enhanced destination perceived value.

Environmental interpretation (from now on, EI) is an effective tool for raising tourists' awareness of how they can improve destination sustainability (Ballantyne et al., 2018). However, depending on the format and design of the EI, it may be more or less impactful from the participant's perspective. For example, it has been found that *gamified* EI enables the tourist to get to know the destination from a sustainability point of view while simultaneously enjoying an enhanced experience (Xu et al., 2017). The literature also finds that gamification can render a tourism service more enjoyable, participatory, and intrinsically motivating (Huotari & Hamari, 2017). However, there remain significant gaps in the literature. For example, scholars are yet to agree on how to best capture the nature of a 'gameful' experience in terms of its dimensions and measurement (Eppmann et al., 2018) and, in the tourism context, the impact of participation in a gamified EI experience on destination perceived value has not been analysed, to date.

At the same time, information and communications technologies (ICTs) offer significant potential in gamifying such services, thus contributing to the sustainability of destinations (Fennell, 2021). The specialist gamification literature underlines that no single method or design for gamification works well across the board in all spheres of application (Seaborn & Fels, 2015). According to the guidelines established in the literature on the effective design of EI experiences (e.g., Coghlan & Carter, 2020) and gamification (e.g., Hamari, 2017), it is essential to pay attention not only to isolated game elements but also to the experience generated in the participant, which must be motivating and enjoyable *and* capable of influencing their behaviour. There is continued interest in the literature regarding the use and impact of this more holistic approach to gamification design when creating an EI program for tourist destinations.

In light of the research above gaps, the primary aim of the present study is, therefore, to establish whether applying gamification to an EI program (using ICTs) constitutes a valid strategy for supporting destinations' efforts to foster tourists' knowledge of sustainability issues and, thus help enhance destination perceived value. The goals of the study are: (a) to propose a holistic design approach to the gamification of an EI program based on the literature review; (b) to test whether a motivating and enjoyable experience is generated for the participating tourists that is capable of positively enhancing their behaviour; and (c) to demonstrate whether participation in a holistically-designed gamified EI program influences destination perceived value.

2. Literature review

2.1 *Implementing a gamified EI program to build competitiveness strategically*

Tourism has links with virtually every other economic sector and has profound and far-reaching impacts on all dimensions of sustainable development (Costa & Lima, 2018; Hall, 2019). However, as noted by Thiel-Ellul and Navarro-Jurado (2014, p.1), "It is not the development of tourist activity that offers a guarantee of the sustainability of destinations; rather, it is the sustainability of the territory that is the key element for their long-term development."

EI is among the tools that can help improve destination sustainability—and, consequently, destination competitiveness. Continued advances in ICTs enable interpretative tools to evolve, particularly enhancing participant experience (Hofman et al., 2022). Gamification can be considered a strategy to raise sustainability while enhancing the tourist experience (Xu et al., 2017).

That said, the results delivered by this strategy largely depend on the quality of the gamification design (Torres et al., 2022). The specialised literature on gamification indicates that the mere inclusion of isolated game elements in an EI program is insufficient to positively affect the participants' behaviour (Morschheuser et al., 2017). Instead, studies point to the need to adopt a holistic gamification design that aligns with the scope of the application and the specific objectives to be achieved via the gamification. The literature also emphasises the importance of designing objectives for the gamified experience that are significant (meaningful) for the participant and, thus, motivate them to successfully perform the tasks set by the game while following the rules of the EI program (Aparicio et al., 2012). Reinforcing this understanding, Goal Systems Theory holds that human behaviour is goal-driven and individuals' goals are represented as cognitive constructs linked to subgoals and means of achievement (Kruglanski et al., 2002). It is also essential to analyse whether the participant feels their gamification experience was motivating and enjoyable.

Based on these factors, it is interesting to advance toward a better understanding of whether taking part in a *gamified* EI experience influences a tourist's perceived value of that destination. This tourist perspective can provide greater knowledge of (a) the holistic gamification approach implemented through ITCs, (b) the measurement of the participant's experience of such a holistic gamification approach, and (c) the impact of participation on tourist behaviour (through the 'destination perceived value' variable).

2.2 *Gamifying an EI program for Tourists: Its effect on destination perceived value*

Perceived value is "the consumer's overall assessment of the utility of a product based on perceptions of what is received and what is given" (Zeithaml, 1988, p. 14). It has been found that perceived value may help increase destination competitiveness (Zhang et al., 2020), including via the conservation of destination resources, which visitors notice and appreciate (Ahn & Kwon, 2020; Polo-Peña et al., 2013; Oviedo-García et al., 2017).

Perceived value can be considered a multidimensional construct, with different authors highlighting different dimensions (Polo-Peña et al., 2012). Most scholars agree that two broad aspects of perceived value can be distinguished: utilitarian factors, such as quality, monetary value, and convenience, and hedonic factors or, in a broader classification, affective factors, which also embrace social factors (Polo-Peña et al., 2012).

Gamification can improve the perception of utilitarian and affective factors (Hamari & Koivisto, 2015a; Torres et al., 2022). In the tourism context, gamification offers a range of benefits for tourists, including both the sheer hedonic fun and enjoyment of simply participating, coupled with the utilitarian value of the game itself, given that the purpose of gamification is to enhance the basic or core service that is offered to everyone (Xu et al., 2017). Studies on online gamification (Hsu et al., 2017; Hsu & Chen, 2018) have

shown that the experience of using an online interface that includes certain game elements positively influences the dimensions of perceived value.

However, based on the contributions of these two studies in the online field, there is evidence of a gap in the scholarship—specifically, regarding the impact of participation in a gamified experience in terms of destination perceived value. It is interesting to determine whether, among those tourist destinations that use gamification, this approach constitutes a valid strategy for achieving the greater perceived value of the destination while promoting awareness of sustainability among visitors. This understanding may contribute to maximising the competitiveness and sustainability of the destination. Suppose gamification is found to generate the greater perceived value of the destination. In that case, this may be because its use is associated with improving a core service (which can generate a greater *functional* value), grounded in an intrinsically motivating and enjoyable experience (which can generate the perception of a higher *affective* value). Therefore, it may be that participating in a gamified EI program geared to enabling visitors to get to know the destination from a sustainability point of view will contribute to generating greater perceived value. On this premise, it is proposed that:

H1: Participation in a gamified EI program significantly and positively affects destination perceived value.

2.3 *Gamification: Holistic design and the gameful experience*

Gamification dates back to 2008, but it was not until 2011 that the first academic research was published. Researchers at that time were interested in discerning the factors that make games enjoyable and motivating (Deterding, 2015).

The early studies dealing with gamification exclusively adopted a *systemic* perspective on games. This corresponds with the widely accepted definition of gamification proposed by Deterding, Dixon, Khaled, and Nacke (2011, p. 9): "Gamification is the use of game design elements in nongame contexts." Later, this understanding was criticised by some scholars for its incompleteness, given that it fails to capture how participants perceive the gamified experience (Huotari & Hamari, 2017).

Some authors thus proposed that the experiential aspects of games should be brought to the fore in scholarly analysis. From this broader perspective, gamification was defined by Huotari and Hamari (2017, p. 25) as: "a process of enhancing a service with affordances for gameful experiences in order to support users' overall value creation." As noted earlier, 'affordance' denotes the motivational features incorporated into the game that promote the specific desired behaviours among participants. The other key term in this definition is 'gameful'. An experience is considered gameful when it is enjoyable and intrinsically motivating—essential features when designing gamification and experiencing it as a user (Hamari et al., 2014).

Thus, if the desired effects are to be achieved using gamification, the participant must enjoy a gameful experience. For this, it is necessary to approach the gamification design holistically (that is, to achieve a design that combines the correct game elements that will optimise the *experiential* dimension for participants). However, previous research examining this approach is scarce (Huotari & Hamari, 2017), and its effects on consumer behaviour variables have not been proven to date.

Therefore, to demonstrate how participating in a gamified experience impacts consumer behaviour, (a) that experience has to be designed holistically, and (b) the participant's experience must be measured to determine whether that experience was, indeed, gameful for them.

2.3.1 *Creating a gamified EI program for tourists based on a holistic design approach*

Previous studies have proposed many gamification experiences involving disparate game elements (badges or points, for instance) to achieve a specific result. This overly simplified design approach, sometimes referred to as "pointification" (Seaborn & Fels, 2015), has met with criticism from some authors (Hamari, 2017; Seaborn & Fels, 2015).

In response to these criticisms, various methods based on a holistic gamification design have been employed in the scholarship. Such methods include the MDA model (referring to "mechanics, dynamics, and aesthetics") developed by Hunicke, LeBlanc, and Zubek (2004). In holistic gamification design, a systematic process is followed to identify, evaluate, and visualise the different aspects, including the context, the participants, the objectives, the design of the interface via which the participant is going to participate in the gamification, and the evaluation of the participant's experience (based on their view of what it was like to participate in the gamification) (Aparicio et al., 2012; Deterding, 2015; Morschheuser et al., 2017).

Based on the recommendations of different authors, then, it is proposed that the design of the gamified program be approached following a systematic procedure comprising four stages (see Figure 1):

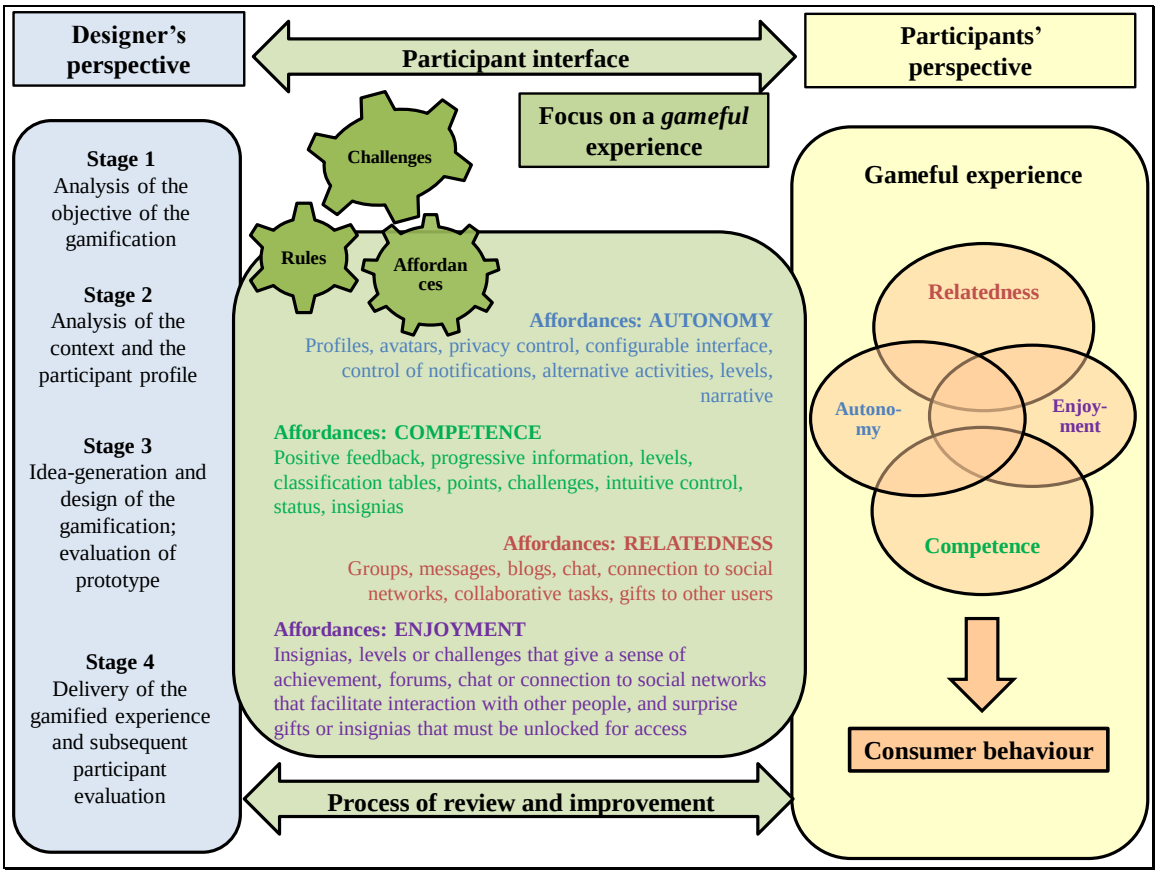
- **Stage 1: Analysis of the objective being pursued**. Stage 1 should begin with an analysis of the objective that is being pursued (in this case, by the EI program) to ensure that this lends itself to the possibilities offered by gamification (Aparicio et al., 2012) and to check that gamification is an appropriate solution for the underlying problem or need to begin with (Morschheuser et al., 2017).

- **Stage 2: Analysis of the context and the participant profile**. In this stage, questions such as where the gamification is to be used must first be identified and understood, and the target group must be defined and characterised. This analysis also involves the identification of participants' needs and motivations within the game and the actions and decisions they must take while in the system (Morschheuser et al., 2017). It cannot be effective if the gamification design is not based on a sound understanding of the participants and the context of use (Morschheuser et al., 2017).

- **Stage 3: Design the interface for the participant to interact with the gamified program.** The interface's creative design starts from a list of design ideas (Morschheuser et al., 2017). Best-practice examples and reoccurring elements in gamification approaches are starting points for this idea-generation phase (Aparicio et al., 2012; Burgers et al., 2015; Xu et al., 2017). Considering the objective to be achieved by the participants (rather than the objective sought by the designer), the tasks they have to perform and the rules they have to follow need to be established. The objective set for the participants through gamification must be engaging and significant enough for them to feel a genuine interest in achieving it and experience immersion in the game (Aparicio et al., 2012). Thus, through the design, every effort should be made to ensure that participants reflect on the significant aspects of the game's overall objective and become aware of its importance (Zuckerman & Gal-Oz, 2014). The optimal combination of affordances that will provide a gameful experience that gives participants control and enables them to exercise their own will throughout the game is sought (Burgers et al., 2015). The design of such affordances provides challenges and also tests expertise (Xu et al., 2017), which enables participants to interact and connect with others (Xu et al., 2017), solve problems, overcome adversity, discover something new, be amazed or surprised, and so on (Robson et al., 2015).

- **Stage 4: Implementation and evaluation of gamification**. Many authors agree on the importance of evaluating gamification to test its success (Aparicio et al., 2012; Morschheuser et al., 2017). The success of a gamification design can be established by verifying that it generates a gameful experience for participants. This is a fundamental step in determining whether participation in a gamified experience can positively influence consumer behaviour variables (Huotari & Hamari, 2017).

Figure 1-Framework diagram proposed to design an EI program based on a holistic gamified approach



Source: The authors

2.3.2 *The gameful experience from a gamified EI program*

When the participant experiences the gamification as enjoyable and intrinsically motivating, it can be deemed a 'gameful' experience. However, most authors overlook the gameful experience as a necessary consequence of participation in gamification designed holistically (Huotari & Hamari, 2017; Koivisto & Hamari, 2019). Specifically in the tourism field, except for the study by Liu, Wang, Huang & Tang (2019), which was conducted in the context of festivals, and that of Lee (2019), which examines the monumental heritage, the previous literature deals solely with the elements that render certain gamification features easier to adopt and use, and how they shape the behaviour of participants. It does not analyse the individual's experience participating in such a program (specifically, to what extent they considered it gameful). Furthermore, as noted earlier, there is no scholarly agreement regarding the dimensions that fully capture a gameful experience or how to measure it (Deterding et al., 2011; Eppmann et al., 2018; Huotari & Hamari, 2017). Given this lack of consensus, there is a need for greater knowledge about the gameful experience (a) due to participating in a gamified program with a holistic design and (b) vis-à-vis the content and dimensions that determine that experience.

Regarding the dimensions of the gameful experience, the contributions of Eppmann et al. (2018) and Liu et al. (2019) are helpful. The two studies highlight the importance of participants' enjoyment via a specific dimension in the scales they develop. Liu et al. (2019) underline the importance of encouraging the participants' intrinsic motivation in a gamification experience.

The most relevant conceptual framework in gamification research is the Self-determination Theory (Seaborn & Fels, 2015). This theory is grounded on the premise that intrinsic motivation derives from three fundamental psychological needs: *autonomy*, understood as the sense of having the freedom to decide *whether* to carry out a specific action and having a choice about *how* to go about it (Burgers et al., 2015); *competence*, referring to the individual's feeling of having the ability to carry out that action and successfully fulfil the purpose to which it is linked (Xu et al., 2017); and *relatedness*, referring to the human need to feel connected to other people and recognised and accepted by them (Koivisto & Hamari, 2019). A person's intrinsic motivation is enhanced when these three psychological needs are met (Deci & Ryan, 1985).

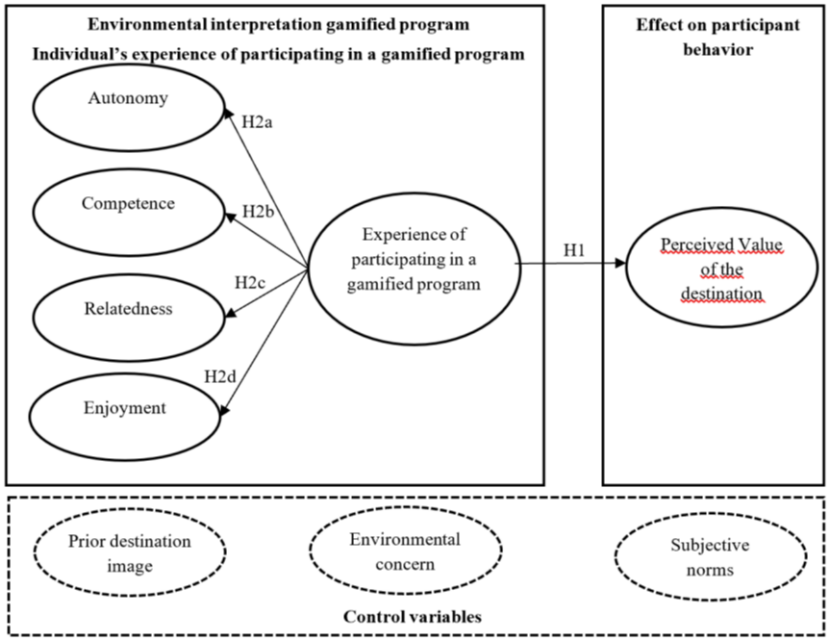
'Enjoyment' is defined as a specific emotional state in which the individual derives pleasure and even happiness from experience (Merhi, 2016), independent of any particular outcome they might achieve from taking part in it (Holbrook, 1994). This emotional state is deemed a core feature of game participation (Ha et al., 2007). Expressly from the point of view of gamification, enjoyment is understood as interaction with the elements of the gamification design (Hamari & Koivisto, 2015a) that arises spontaneously among participants as they explore the game's features and respond creatively to them (Hamari & Koivisto, 2015a). Their enjoyment also motivates participants to show greater perseverance when adopting the behaviours the gamification experience is designed to promote over the longer term (Deci & Ryan, 1985; Wu & Liu, 2007). Enjoyment has been found to influence consumer behaviour, such as individuals' responses to product innovations (Aroean, 2012) or new products or experiences (Hoffman & Novak, 1996).

According to the literature and as shown in Figure 1, the satisfaction of basic needs linked to intrinsic motivation and a sense of enjoyment can be achieved through a gamified experience enhanced by specific motivational elements (affordances). For this reason, gamification experiences should be designed holistically, as this contributes to creating a system that can influence the participant's behaviour by creating a gameful experience for them. It is therefore hypothesised that:

H2: (a) Autonomy, (b) competence, (c) relatedness, and (d) enjoyment are dimensions of the gameful experience derived from a gamified EI program.

In short, gamification can be understood as a process that embraces both the designer's and the participant's perspectives to create a holistic design that delivers positive psychological outcomes, including a gameful experience (as shown in the research model represented in Figure 2). Gamification has been found to produce effective results in influencing consumer behaviour, as reflected, for example, in an increase in perceived value.

Figure 2-Proposed research model



Source: The authors

3. Methodology

3.1 *Study sample and procedure*

Spain was chosen as the site of the empirical study because it is a leading tourist destination on an international scale (UNWTO, 2020). As such, it faces several challenges in achieving long-term destination sustainability and calls to action toward this essential goal (Ministerio et al. y Turismo, 2019).

Our sample comprised British and American adults (aged 18+) who were potential tourists to Spain, with both cohorts known to be important to the country's tourism industry (INE, 2020). As none of the subjects had ever visited Spain before, this ensured we avoided the possible effect of previous destination experience on the dependent variable. Our approach to building the sample aligned with the procedures followed in other studies performed on an English-speaking public (Pike et al., 2021). For example, we employed an international Internet user panel provided by an external company (in this case, Dynata) to ensure we achieved representativeness in our study sample.

Those potential subjects who confirmed their agreement to participate in the research were given access to a secure intranet containing the survey questions and the gamified EI program in which they had been invited to participate. They were then asked to undertake the following steps (1) to respond to a questionnaire structured around the three primary scales in our study (their preexisting image of Spain, their level of concern for the environment, and subjective norms); (2) to participate in the gamified EI program under controlled time conditions to ensure a minimum length of exposure prior to moving on to the final step; and (3), to answer a second set of questions, this time relating to the scales for gameful experience, 'perceived value' (which was the dependent variable), and their sociodemographic profile (based on the variables of age, gender, and employment status.

While our sample size was relatively small, it was sufficient to ensure a sound statistical analysis because all the subjects participated fully in the entire EI program (Hair, Black, Babin & Anderson, 2009). The final sample comprised 158 subjects who had all returned valid questionnaires. The demographic profile of the sample largely coincided with that of the study population (British and American potential tourists) (IndexMundi, 2019; Koema, 2018) (see Table 1).

Table 1 - Demographic profile of the final study sample

Variable	Value (percentage)
Gender	41% Male 59% Female
Age	17% between 18 and 29 years old 24% between 30 and 44 years old 38% between 45 and 65 years old 21% over 65 years old
Employment status	57% in employment 43% not in employment

Source: The authors

3.2 *Participation in gamification*

A gamified experience was designed holistically, following the staged process outlined in Figure 3. In **Stage 1**, the objective of the proposed program was analysed to assess whether gamification was compatible with achieving the desired results. In **Stage 2**, the context of the application and the profile of the participants were analysed. This resulted in an overall design concept for the gamification, featuring content about the destination centred on sustainability. Our approach drew on Wolf, Stricker, and Hagenloh's (2013) recommendations for the design concept and was based on multimedia files that blended written text, images, and sound.

Figure 3-Structure of the gamified EI program

Source: The authors

The content primarily focused on information about the destination's resources and the environmental sustainability guidelines established by White, McCrum, Blackstock, and Scott (2006). Practical information was included on how to act correctly in each place (following the recommendations of Ballantyne, Packer & Hughes., 2009).

Stage 3 was concerned with designing the interface via which the subject was to interact with the gamified program (Figure 3). Here, it was essential to respond to the objectives set for the participants and to identify the right combination of affordances to incorporate, as well as the rules of the game and the goals set for the gamified experience. On this basis, the process to be followed by the participant was designed (as per Figure 3), bringing together a combination of affordances aimed at promoting intrinsic motivation and enjoyment in light of previous recommendations made by other authors (see Table 2).

Table 2 - Affordances designed into the gamification

Affordances and design elements used in the gamification	Heightens intrinsic motivation:	Increases participants' fun:
Interesting and challenging narrative	x	x
Personalizable avatar	x	
Profile with a record of personal details and performance	x	
Clear instructions on the challenges, tasks, and levels to be fulfilled	x	
Points, insignias, rewards, and surprise elements	x	x
Classification tables	x	x
Option to share on social networks	x	x

Source: Based on the works of Aparicio et al. (2012), Burgers et al. (2015), Hamari et al. (2014), Lounis, Pramatari & Theotokis (2014), Robson et al. (2015), and Xu, Cui, Ballantyne & Packer (2013).

Finally, with the game interface fully designed, **Stage 4** involves the delivery of the gamified experience and its evaluation by participants, based on the scale validation for 'gameful experience' and the measurement of its effect on perceived value.

3.3 *Measurement scales*

'Gameful experience' was measured on a scale we first validated, covering intrinsic motivation and enjoyment. The scale developed by Lieberoth (2015) was used to measure intrinsic motivation, while that developed by Van der Heijden (2004) was used to measure enjoyment. The latter was also previously applied by Hamari and Koivisto (2015a). Destination perceived value was measured on a scale based on Frías-Jamilena et al. (2017) (see Appendix).

To check for any variables that may have influenced the proposed effect of participating in a gamified EI program on perceived value, three control variables were applied: 'preexisting image of Spain as a tourist destination', 'environmental concern', and 'subjective norms' (Malhotra, 2010). All three were measured before the subjects were exposed to the gamified EI program (Kirk, 2014). Following the approach of earlier studies (Beerli & Martín, 2004; Frías et al., 2008), we used a semantic differential scale to measure preexisting destination image. Turning to the environmental concern, the variable was measured on a scale previously used by Chang, Zhang, and Xie (2015) and Kim and Choi (2005). Moreover, once again, Hamari and Koivisto's (2015b) work was used as a benchmark for selecting the 'subjective norms' measurement scale (see Appendix). Finally, three variables (gender, age, and employment status) were captured to create the sociodemographic profile of the sample (as per Table 1).

3.4 *Data Analysis*

It can be seen from Figure 2 that the 'Experience of participating in a gamified EI program' comprises the first-order dimensions 'Autonomy', 'Competence', 'Relatedness', and 'Fun'. 'Perceived value' (the dependent variable) ', Preexisting destination image', 'Environmental concern', and 'Subjective norms' (control variables) are all first-order constructs.

The method selected to test the research hypotheses was structural equation modelling (SEM), using AMOS v.21 software to validate the measurement scales and test the relationships between variables.

Starting with the estimated model's psychometric properties, we found that the Chi-square test of multivariate normality was significant. Therefore, we opted to estimate the model with the maximum likelihood method coupled with bootstrapping (Yuan & Hayashi, 2003). The results relating to overall model fit (normed Chi-square, 2.16; RMSEA, 0.08) were acceptable relative to the recommended threshold. The indicators for incremental fit also presented acceptable values: CFI (0.92), IFI (0.92), and TLI (0.91). Overall, the model fit can thus be deemed acceptable.

4. Results

First, to verify that a variable adequately reflects the composition of a scale, it is necessary to confirm that the scale in question presents an appropriate level of validity and reliability (Devlin et al., 1993). On this basis, we estimated the composite reliability and variance extracted from each of the first-order scale dimensions to determine their internal consistency. The values obtained for composite reliability and variance extracted were close to, or above, the reference values (0.70 and 0.50, respectively—see Table 3). One exception was 'Experience of participating in a gamified EI program' (second-order dimension), whose variance extracted value was very close to the reference threshold of 0.50. These results indicated that the validity and reliability of the measurement scales for the variables 'Experience of participating in a gamified EI program' (with its dimensions of autonomy, competence, relatedness, enjoyment, and perceived value) were valid.

Table 3 - Variables/dimensions and their composite reliability and variance extracted

Variables	Dimensions	Composite reliability	Variance extracted
Experience of participating in the gamified program*		0.76	0.46
	Autonomy	0.93	0.81
	Competence	0.95	0.78
	Relatedness	0.93	0.82
	Enjoyment	0.95	0.83
Perceived value		0.96	0.81
Prior destination image		0.97	0.89
Environmental concern		0.93	0.74
Subjetive norms		0.93	0.78
*Second-order dimension			

Source: The authors

Next, we conducted a confidence interval test to test for discriminant validity. The result showed that there was discriminant validity, as the value '1' was not present in the confidence interval of the correlations between the different first-order dimensions (Anderson & Gerbing, 1988).

The results above validated that the 'Experience of participating in a gamified EI program' can be captured as a second-order construct containing the dimensions 'Autonomy', 'Competence', 'Relatedness', and 'Enjoyment'. Hypothesis 2, therefore, receives empirical support.

Second, the results of the proposed research model were examined. It is essential to consider the effect of the control variables in the research model—preexisting destination image, environmental concern, and subjective norms—on participants' experience of the gamified program and how they perceive the destination's value. It was found that the three variables significantly influence the 'experience of participating' variable (*preexisting destination image*: standardised coefficient 0.24, confidence interval 0.04–0.44, and p-value 0.05; *environmental concern*: standardised coefficient 0.34, confidence interval 0.16–0.52, and p-value 0.003; and *subjective norms*: standardised coefficient 0.35, confidence interval 0.18–0.53, and p-value 0.002). However, they have no such effect on perceived value (*preexisting destination image*: standardised coefficient 0.12, confidence interval -0.02–0.29, p-value 0.18; *environmental concern*: standardised coefficient 0.01, confidence interval -0.14–0.18, and p-value 0.88; and *subjective norms*: standardised coefficient -0.25, confidence interval: -0.19–0.13, and p-value 0.73). These results show the importance of considering the proposed control variables, as they enabled the bias in the research model to be corrected. Based on these results, we now turn to the results relating to Hypothesis 1.

Hypothesis 1 proposes that participation in the gamified experience positively affects destination perceived value. The results suggest that this effect can be considered significant (0.55, with a confidence interval of 0.39–0.72). The p-value of these coefficients was >0.01, which provides empirical support for Hypothesis 1 and indicates that participation in a gamified EI program does, indeed, contribute to an increase in the perceived value of the destination.

5. Discussion

Continually improving the competitiveness of tourist destinations has become a primary objective among tourism managers. This calls for identifying strategies that help achieve a more excellent perceived value of the destination from the market's perspective. However, it is now essential to reorientate and prioritise strategies compatible with the destination's sustainability (Oviedo-García et al., 2017; Yenidogan et al., 2021).

This study sought to determine the extent to which an EI program that can be gamified using ICTs constitutes an effective strategy for contributing to destination competitiveness. We opted to study gamification as the literature has linked this approach to the creation of enriched tourist experiences (Xu et al., 2017). Evaluating the effectiveness of gamification implies building the knowledge base regarding its design, the experience generated by the participant, and its effect on consumer behaviour (e.g., Hamari, 2017; Seaborn & Fels, 2015).

No single method of gamification design is valid for all fields of application (Robson et al., 2015; Seaborn & Fels, 2015). In this study, we identified that to achieve a holistic design in the gamification of an EI program; the following stages must be followed: a (a) analysis of the objective of the gamification, (b) analysis of the context and the participants; (c) design of the interface through which the participant is to participate in the gamification, which determines the tasks to be carried out and the rules to be followed while undertaking them. Here, it is of utmost importance to arrive at the optimal combination of affordances (with a focus on the gameful experience to give the participant control and enable them to exercise their own will during the game), challenge and expertise, and the possibility of interacting with other participants, among other aspects; and (d) the delivery of the gamified

experience and its evaluation by the participants. It is essential to verify that a gameful experience has been generated for the participants, such that it can influence their behaviour.

In this last stage, to verify that participants have enjoyed a gameful experience, potential tourists from a given destination were used in the present study, and their participation in the gamified EI program (based on a holistic design) was controlled. The results showed that the *gamified* environmental program generated an experience that participants found intrinsically motivating. In other words, this gamified design successfully produced feelings of autonomy, competence, and relatedness among participants and generated enjoyment for them. These results are relevant for the tourism context because enjoyment and motivation are known to be fundamental features of the touristic experience (see, e.g., Polo-Peña et al., 2012).

Finally, these findings are also relevant to the specialist scholarship dealing with perceived value. First, gamification of the EI program can generate a gameful experience among participants, which has been shown here as an antecedent of destination perceived value. The EI experience's design format influences outcomes (Ardoin et al., 2015). These results are also pertinent to the specialist sustainability literature and respond to the identified need to identify strategies that can foster flourishing destinations based on sustainable tourism.

5.1 *Practical implications, limitations, and future research directions*

The results of the present study are of value to both public and private entities devoted to improving and advancing tourist destinations by providing enhanced tourist experiences while supporting destination sustainability. These results lead us to propose that destinations should offer gamified EI experiences online and indicate that, as well as contributing to a superior participant experience, this approach prompts potential tourists to assign greater value to the destination. This dual outcome is critical for more mature destinations in their continued efforts to sustain tourist appeal in the medium–long term.

The effectiveness of EI programs is found to be greater when these encourage participant interaction (as has traditionally been achieved thanks to tour guides) (Ballantyne et al., 2009). However, with the arrival of ICT and online environments, the scope for such interaction is now enhanced (Hsu et al., 2017; Paco & Pérez, 2015), offering new possibilities for gamification-based strategies such as gamified EI programs. This approach enables potential tourists to explore destinations in an interactive, readily accessible, and personalised way.

Our analysis provides interesting insights regarding critical factors in designing gamified EI experiences. Design should not be reduced to merely including disparate game-like elements, focusing solely on systemic features (Huotari & Hamari, 2017). Instead, the gamification design should be informed by the ultimate objective the experience needs to deliver and the specific context of the application (in this case, to improve the tourist experience and encourage the sustainability of Spain as a tourist destination). On this basis, designers must identify the optimal combination and use of elements and affordances to generate a gameful experience for participants. It is also crucial to assess whether the gamification has achieved the desired results among participants. In the specific case relevant to this study, this means evaluating whether tourists' participation in the gamified design led them to enjoy an intrinsically motivating experience (measured in autonomy, competence, and relatedness).

Finally, our results demonstrate to destination managers that market-oriented strategies can be adopted and aligned to promote destination sustainability. Offering a gamified EI program in which potential tourists can participate generates an experience that can offer managers opportunities to keep tourists engaged via the destination's website or social media, enhance visit intention, and encourage visitors to help protect the destination. Thus, gamified EI programs could be integrated into marketing campaigns that, in addition to promoting the destination itself, engage tourists in protecting it and supporting its sustainability through appropriate behaviours in the targeted region.

5.2 *Limitations and future research directions*

The present study presents a series of limitations that should be borne in mind when interpreting the results and that, in themselves, can help shape potential lines of research for the future. Starting with the empirical aspect of the study, a leading international destination with a mature profile was chosen. However, it would be interesting to replicate the study in different geographical areas to test how gamified EI programs perform in these different contexts in terms of their effectiveness.

Secondly, it would be interesting to analyse new factors that may affect the design of the gamified EI program and its impact on tourist behaviour. Among such factors could be variables related to the international nature of tourism: cultural differences among consumers, for instance, or differences in psychological distance. It would also be valuable to progress toward a better understanding of the effect of participating in gamified EI programs on tourists during and after their stay. Drawing on Cognitive Appraisal Theory (Lazarus, 1991) and Goal System Theory (Kruglanski et al., 2002), future studies could include variables such as agency, goal relevance, and goal congruence (Choi & Choi, 2019; Kim, 2021; Watson & Spence, 2007). These variables have

attracted interest in gamification (Schlager et al., 2016), particularly for their capacity to generate fun and enjoyment in tourism (Choi & Choi, 2019). Hence, their inclusion could lead to a better understanding of tourists' experience of gamified EI.

Third, the combination of the 'new normal' experienced by the tourism industry due to the COVID-19 pandemic and the need to continue making progress toward the United Nations Sustainable Development Goals points to particular lines of research that should be considered for the future. For instance, it would be valuable to determine whether the use of gamified EI programs effectively influences the variables of consumer behaviour that are most relevant to achieving sustainable tourism—such as improving perceived safety at the destination or adopting pro-environmental behaviours. It would also be interesting to identify whether specific consumer characteristics, such as the level of information literacy self-efficacy among participants, may influence the impact of gamified EI programs.

Credit author statement

All authors have contributed equally. All authors have read and agreed to the published version of the manuscript.

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Appendix -Variables and their respective measurement scales

Construct name and source	Indicator	Survey item
Autonomy (IMI, 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, 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, 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 and 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
Perceived Value (Frías-Jamilena et al., 2017)	PV1	This destination seems to offer reasonable prices.
	PV2	Considering what I would have to spend on this trip, this destination offers real value-for-money.
	PV3	The costs of visiting this destination look like a bargain compared to the benefits I received.
	PV4	This destination seems economical.
	PV5	This destination seems like a good deal.
Prior destination image (Beerli & Martín, 2004; Frías et al., 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