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**Emotional mechanics of gamification and value co-creation: the digital platform Nike+ as a B2B2C ecosystem**

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## Emotional mechanics of gamification and value co-creation: the digital platform Nike+ as a B2B2C ecosystem

### Abstract

**Purpose:** This study investigates the impact of utilitarian, hedonic and social emotional mechanics in gamified digital platforms on the components of value co-creation.

**Design/methodology/approach:** Hypotheses are proposed to test the emotional mechanics of gamification as antecedents of value co-creation in terms of the components of the DART (Dialogue, Access, Risk assessment, Transparency) model. The Nike+ gamified digital platform is used as the context for the empirical analysis. The hypothesis testing is performed from the consumer perspective, with data gathered using a questionnaire sent to users of the Nike+ application.

**Findings:** The social emotional mechanics of gamification have a positive impact on the value creation components of dialogue, access, transparency and risk. Utilitarian and hedonic mechanics also exert an impact on the value creation component of access. This study contributes to the value co-creation literature. The findings also reveal the role of customer emotions in embracing gamified platforms in a business-to-business-to-consumer (B2B2C) ecosystem.

**Originality/value:** This paper proposes a combination of approaches that have traditionally been studied in isolation, placing emotions at the heart of the value co-creation paradigm.

**Practical implications:** Practitioners and consumers in B2B2C ecosystems can gain insight into how to interact in digital gamified platforms and how to co-create value. The study shows the importance of customers' emotional mechanics when participating in

gamified platforms. The results can help organisations ensure the success of their value co-creation processes.

**Keywords:** gamification, value co-creation, customer experience, digital platform, B2B2C ecosystem

**Article classification:** Research paper

## 1. Introduction

Ensuring a positive interactive experience has become a key factor to ensure the success of products and services in increasingly competitive markets. Thus, understanding the creation of value and improving services have been highlighted as important topics on the research agenda (Ostrom *et al.*, 2015). Ideally, this experience would translate into value for both consumers and organisations.

According to Norman (2004), one of the key elements to interactive experiences is emotion management. Knowledge of the emotions that users experience when they partake in the creation of goods and services is especially important to direct them towards co-creative processes (Chio *et al.*, 2016; Sugathan *et al.*, 2017).

Few quantitative studies have explored the effects of consumer emotions in value co-creation processes (Zhang *et al.*, 2018b). As reported by Ojiaku *et al.* (2020), much of the academic debate surrounding co-creation has focused on conceptual frameworks or foundations (Flores *et al.*, 2015; Neghina *et al.*, 2015; Payne *et al.*, 2008; Prahalad and Ramaswamy, 2004; Saarijarvi, 2012), with very few empirical studies (Randall *et al.*, 2011; Rajan and Read, 2016). Therefore, an understanding of consumer perceptions and behaviours in relation to value co-creation processes remains conspicuously absent from the literature (Chen *et al.*, 2018).

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3 Changes in the way that interactions occur following the emergence of online  
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5 communications, which enable interactions between a large number of consumers and  
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7 service providers (Spagnoletti *et al.*, 2015), have forced organisations to redesign their  
8  
9 business models to adopt a user experience orientation. Hence, digital platforms have  
10  
11 become “a new business model that uses technology to connect people, organizations,  
12  
13 and resources in an interactive ecosystem in which amazing amounts of value can be  
14  
15 created and exchanged” (Parker *et al.*, 2016, p. 10). Platform-based technologies, such as  
16  
17 mobile phone applications designed with gameful elements, are becoming more and more  
18  
19 important because they allow companies and the users of these games to interact within  
20  
21 a controlled ecosystem (Babb *et al.*, 2013). This phenomenon partially explains the rapid  
22  
23 spread of gamification in the business world (Ruiz-Alba *et al.*, 2019; Pasca *et al.*, 2021).  
24  
25 Gamification refers to “designing information systems to afford similar experiences and  
26  
27 motivations as games do, and consequently, attempting to affect user behavior” (Koivisto  
28  
29 and Hamari, 2019, p. 191). It is thus possible to improve the online experience (Hsu and  
30  
31 Chen, 2018) and the value co-creation process (Rodrigues *et al.*, 2020), thanks to the  
32  
33 emotional context that such designs create (Yang *et al.*, 2017).  
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36  
37 Gamification has the potential to influence and increase people’s commitment and to  
38  
39 encourage certain behaviours (Kuo and Chuang, 2016). One of the goals of gamification  
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41 is to support and motivate users to complete tasks inspired by the services offered by a  
42  
43 business (Huotari and Hamari, 2012). This goal can be achieved by offering a gameful  
44  
45 experience (Koivisto and Hamari, 2014; Leclercq *et al.*, 2020).  
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48  
49 In recent years, numerous studies have provided reviews of the gamification literature  
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51 (Hamari *et al.*, 2015b; Searbon and Fels, 2015; Koivisto and Hamari, 2019; Tobon *et al.*,  
52  
53 2020). These reviews describe not only the state of the art but also the areas that require  
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3 further research. For example, research is needed to investigate how gamification can  
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5 achieve behavioural changes (Mitchell *et al.*, 2020).  
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8 The literature explains the impact of gamification on emotional states (Sailer *et al.*, 2017;  
9  
10 Shi *et al.*, 2017; Xi and Hamari, 2019) and describes the connections between  
11  
12 gamification and value co-creation processes (Nobre and Ferreira, 2017; Merhabi *et al.*,  
13  
14 2021; Patricio *et al.*, 2020). Rodrigues *et al.* (2020) went further, proposing a “co-created  
15  
16 gamification methodology” as a specific method to address the connections between  
17  
18 value co-creation and gamification. They attempted to evaluate the extent of knowledge  
19  
20 on the topics of value co-creation and gamification, as well as the advantages and  
21  
22 disadvantages of gamified co-creation and the structural conditions required to implement  
23  
24 a business strategy. Knowledge of the connection between gamification and co-creation  
25  
26 enables the development and understanding of ways to improve co-creation practices  
27  
28 (Patricio *et al.*, 2020).  
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33 In this context, given that emotions have been under-explored in relation to value co-  
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35 creation processes and given the lack of empirical analyses of the psychological variables  
36  
37 that can drive co-creation processes through experience, the aim of this study is to analyse  
38  
39 the impact of the emotional mechanics inherent in gamified systems on value co-creation.  
40  
41 The study thus advances knowledge of value co-creation by placing emotions at the heart  
42  
43 of the process, under the premise that gamified platforms are necessary but not sufficient  
44  
45 to ensure value co-creation in business-to-business-to-consumer (B2B2C) ecosystems.  
46  
47 To measure the impact on value co-creation, an experience-oriented approach to co-  
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49 creation of value is adopted, and the DART (Dialogue, Access, Risk assessment,  
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51 Transparency) model is used. This model was developed by Prahalad and Ramaswamy  
52  
53 (2004a), who argued that organisations can drive co-creative practices through four  
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55 dimensions: dialogue, access, transparency and risk assessment. Regarding gamification,  
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3 a psychological perspective is adopted, where the utilitarian, hedonic and social  
4 emotional mechanics inherent in all gamified systems are considered the ideal constructs  
5 to measure the impact on co-creative processes. The Nike+ application is used as a  
6 reference for the analysis.  
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11  
12 The paper is structured as follows. First, a review of the literature on the emotional  
13 mechanics of gamification and value co-creation is provided. This review offers support  
14 for the research hypotheses. Next, the research design and empirical analysis are  
15 described. A discussion of the results and the theoretical and managerial implications  
16 follows. Finally, the limitations of the study and ideas for future research are outlined.  
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## 23 **2. Theoretical background**

### 24 **2.1. Value co-creation and emotions**

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26 Today's consumers demand high levels of customisation in their consumer experiences,  
27 forcing companies to co-create value with customers (Ojiaku *et al.*, 2020). Consumers no  
28 longer demand services but instead seek experiences through services (Pralhad and  
29 Ramaswamy, 2004a). They have ceased to be mere users, instead playing the role of co-  
30 creators of value (Wang *et al.*, 2004). Hence, the current trend is to attempt to orient value  
31 co-creation processes towards the user experience.  
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42 Cheng *et al.* (2012) identified three approaches associated with value co-creation. These  
43 approaches, which are summarised in Table I, are (1) value co-creation through the  
44 exchange of resources related to service-dominant logic (Vargo and Lusch, 2004); (2)  
45 value co-creation through interactions related to service logic (Grönroos, 2006); and (3)  
46 value co-creation through experience (Pralhad and Ramaswamy, 2004a, 2004b).  
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53 [Insert Table I. Main approaches to value co-creation]

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55 Vargo and Lusch (2004), the proponents of service-dominant logic theory, have argued  
56 that consumers become co-creators of value when they use a product or service. That is,  
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3 value is created when customers use products or services to meet their needs or wants,  
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5 which is referred to as “value in use”. Grönroos (2006), on the other hand, developed  
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7 service logic, which, unlike service-dominant logic, is based on the idea that value co-  
8  
9 creation arises from interactions, such that consumers co-create value when they interact  
10  
11 with the organisation. Finally, Prahalad and Ramaswamy (2004 a, 2004b), the proponents  
12  
13 of value co-creation through experience, studied the “migratory” process towards the co-  
14  
15 creation of experiences. Under this view, the interaction between company and consumer  
16  
17 is active and can be initiated by either of them, and the set of interactions that emerge are  
18  
19 focused on co-creating value through experiences. Value co-creation arises from the joint  
20  
21 participation of consumers and the firm in creating unique experiences.  
22  
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24  
25 The present study uses the experience-oriented approach to value co-creation, where  
26  
27 value co-creation occurs in an interactive experiential environment through gamified  
28  
29 platforms that have the right features for this value co-creation to occur. Given that  
30  
31 experiences evoke emotions (Robson *et al.*, 2015), it is particularly important to consider  
32  
33 the emotional states of users when they partake in co-creative activities.  
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37 The value co-creation literature acknowledges the influence of emotional states in  
38  
39 ensuring co-creative success (Payne *et al.*, 2008; Sugathan *et al.*, 2017; Wu and Gao,  
40  
41 2019). The fundamental premise is that firms cannot unilaterally offer high-quality  
42  
43 services. Instead, they must adopt philosophies oriented at the joint creation of memorable  
44  
45 experiences by preserving long-term emotional ties (Zhang *et al.*, 2018a; Vargo *et al.*,  
46  
47 2008). However, memorable experiences cannot be sold but should instead be co-created  
48  
49 by companies and their customers (Chathoth *et al.*, 2016).  
50  
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53 Consumers of experiences tend to participate positively in co-creation activities when  
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55 they are pleased with something (Wen *et al.*, 2018; Zang *et al.*, 2018a). However, despite  
56  
57 agreement amongst academics about the importance of emotions in value co-creation  
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3 processes (Chio *et al.*, 2016), few studies have empirically examined emotions (Zhang *et*  
4  
5 *al.*, 2018b) and none have done so in a (B2B2C) environment.  
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7  
8 Digital platforms have led to the emergence of virtual communities where a network of  
9  
10 firms, platform owners, suppliers, retailers and other actors interact with a huge number  
11  
12 of customers and where information can move and flow in the distribution, marketing and  
13  
14 delivery of products and services worldwide (Gou *et al.*, 2018). Therefore, virtual  
15  
16 environments such as the Internet and social media have radically changed the process  
17  
18 and characteristics of interactions in B2B2C ecosystems during co-creation (Ortt and  
19  
20 Smits, 2006). Also, the implementation of gamified platforms in business seems to be  
21  
22 becoming more accepted, with such platforms offering a high return on investment and  
23  
24 greater customer participation (Conaway and Garay, 2014). Hence, many industries seek  
25  
26 to involve their customers through the incorporation of gameful techniques in their  
27  
28 marketing processes (Merhabi *et al.*, 2021; Liu *et al.*, 2018), which has led to interest  
29  
30 from researchers in the phenomenon of gamification (Hsu and Chen, 2018).  
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## 34 35 **2.2. Gamification and emotions**

36  
37 Gamification is a multidisciplinary concept, defined from different perspectives (Buckley  
38  
39 *et al.*, 2019). Many refer to the work of Deterding *et al.* (2011), who defined gamification  
40  
41 as “the use of game design elements in nongame contexts”. However, given the  
42  
43 importance of considering the experiential nature of games, an increasing number of  
44  
45 studies define gamification as “a design approach that draws from game design in order  
46  
47 to induce gameful experiences in different contexts” (Koivisto, 2017, p. 5). Along these  
48  
49 lines, Huotari and Hamari (2017, p. 25) described gamification from the consumer  
50  
51 perspective as “a process of enhancing a service with affordances for gameful experiences  
52  
53 in order to support users’ overall value creation”.  
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3 Gamification is thus depicted as a process that offers fun experiences and supports value  
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5 creation, which implies that gamification is related to emotional states (Huotari and  
6  
7 Hamari, 2017). Mullins and Sabherwal (2020, p. 311) reported that “emotion represents  
8  
9 a significant uncharted territory in gamification, which is somewhat surprising  
10  
11 considering the role of emotional engagement in gameful experiences”. Table II  
12  
13 illustrates the most relevant theories of emotions in the context of gamification.  
14  
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16  
17 According to Searbon and Fels (2015), the theoretical foundations of gamification were  
18  
19 essentially developed under self-determination theory (Ryan and Deci, 2000a), the theory  
20  
21 of intrinsic and extrinsic motivation (Ryan and Deci, 2000b) and flow theory  
22  
23 (Csikszentmihalyi, 1990). These theories are concerned with human motivation and the  
24  
25 impulse to meet innate psychological needs. Building on these foundations, new  
26  
27 methodological approaches that invoke the role of emotions to understand gamification  
28  
29 have emerged. For example, Robson *et al.* (2015) drew upon work by Hunicke *et al.*  
30  
31 (2004) to propose the MDE (mechanics, dynamics and emotions) model as a framework  
32  
33 to show how the mechanics, dynamics and emotions of gamification can be used to create  
34  
35 gamified experiences. Mullins and Sabherwal (2020) extended the theoretical MDE  
36  
37 model, explicitly depicting emotion as a key factor in human behaviour. They thus  
38  
39 provided a cognitive and emotional perspective of gamification that explains how the  
40  
41 mechanics of the game can interact with emotion and cognition to produce the desired  
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43 outcomes.  
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49 [Insert Table II. Psychological perspective of gamification]  
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52 This background shows that the gamification literature has started to introduce the  
53  
54 psychological perspective as a theoretical pillar, recognising that gamification stimulates  
55  
56 certain emotional mechanics to bring about favourable behavioural changes for the  
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3 organisation (Bittner and Shipper, 2014; Hamari and Koivisto, 2015a; Seaborn and Fels,  
4  
5 2015) and improve the user experience (Hsu and Chen, 2018).

6  
7 Given that gamified experiences engage users by stimulating their emotions (Mullins and  
8 Sabherwal, 2020), this study adopts the psychological perspective of gamification by  
9  
10 focusing on the emotional reactions of users through their experiences (Scherer and  
11  
12 Tannenbaum, 1986). Specifically, this research focuses on the role of applying  
13  
14 gamification's utilitarian, hedonic and social mechanics in value co-creation processes.  
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17  
18 From a psychological perspective, the literature offers support for the association of  
19  
20 utilitarian, social and hedonic emotional mechanics with gamification (Conaway and  
21  
22 Garay, 2014; Hamari and Koivisto, 2015a; Hamari and Koivisto, 2015b; Hamari and  
23  
24 Keronen, 2017; Huotari and Hamari, 2012; Koivisto, 2017; Shi *et al.*, 2017), thanks to  
25  
26 the characteristics inherent in the configuration of any gamified system.  
27  
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29  
30 Given that the *utilitarian emotional mechanism* is awakened when products are useful,  
31  
32 practical, decisive and productive (Baltas *et al.*, 2017), that the *hedonic emotional*  
33  
34 *mechanism* is activated as a result of the pleasure reported by the experience with the  
35  
36 service (Chitturi *et al.*, 2008; Stock *et al.*, 2015; Baptista & Oliveira, 2015) and that the  
37  
38 *social emotional mechanism* are related to the need for relations with and acceptance from  
39  
40 others (Deci and Ryan, 2000; Hamari and Koivisto, 2015b; Ryan and Deci, 2000),  
41  
42 gamified digital platforms seem to be an appropriate way of stimulating these emotions.  
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### 46 47 **2.3. The DART model**

48  
49 To measure the process of value co-creation through experiences, the DART model  
50  
51 proposed by Prahalad and Ramaswamy (2004b) is used. Although the literature offers  
52  
53 different models to measure value co-creation (Gröons, 2011; Payne *et al.*, 2004), the  
54  
55 DART model is recognised as the most efficient tool in research from an experiential  
56  
57 approach (Solakis *et al.*, 2017) because it prepares firms to co-create strategic value  
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3 through four co-dependent dimensions: dialogue, access, transparency and risk  
4 assessment (Prahalad and Ramaswamy, 2004b; Albinsson *et al.*, 2016).  
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7 Dialogue refers to the exchange of knowledge and understanding between a company and  
8 its customers. Access refers to the degree to which a company gives its customers  
9 experiences at multiple interaction points. Transparency consists of providing transparent  
10 information to create trust. Risk assessment consists of informing customers about the  
11 possible risks of the product.  
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18 The DART model is based on the assumption that the market is no longer a target but  
19 instead a forum of co-creation experiences through which companies and customers  
20 exchange information about new products and services through these four dimensions  
21 (Schiavone *et al.*, 2014).  
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28 As noted by its proponents, although the DART model explains that firms can combine  
29 these four dimensions to engage customers to co-create value, these factors alone may  
30 not produce compelling co-creation experiences. Companies must therefore offer  
31 consumers platforms where collaboration can flow and co-creation can emerge.  
32 Accordingly, gamified digital platforms can encourage the process of co-creation through  
33 the emotions that they evoke in users.  
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#### 42 **2.4. Development of hypotheses**

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44 The theoretical argument presented in the previous paragraphs aims to justify the  
45 relationship between gamification and co-creative processes by considering emotional  
46 states in both cases. Utilitarian, hedonic and social emotions are the emotions that the  
47 gamification literature describes as inherent in gamified systems (Shi *et al.*, 2017).  
48 Researchers have started to pay attention to hedonic and utilitarian components to  
49 understand consumer attitudes when they experience goods and services. Batra and  
50 Ahtola (1990, p. 159) reported the following on this topic: “Consumers purchase goods  
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3 and services and perform consumption behaviors for two basic reasons: (1)  
4 consummatory affective (hedonic) gratification (from sensory attributes), and (2)  
5 instrumental, utilitarian reasons concerned with 'expectations of consequences' (of a  
6 means-ends variety, from functional and nonsensory attributes).”  
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10 Accordingly, hedonic characteristics can help relationships last by causing emotional  
11 pleasure that can lead to greater commitment to a product (Hsu and Chen, 2018), as can  
12 utilitarian characteristics by meeting the functional, instrumental and practical needs of a  
13 good or service (Chitturi *et al.*, 2008).  
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20 Both hedonic and utilitarian emotions contribute, to varying degrees, to the overall  
21 goodness of a consumer behaviour or product (Batra and Ahtola, 1990), and both  
22 emotions can be utilised to engage users in the co-creation of goods and services.  
23 Moreover, utilitarian and hedonic emotions exert a significant positive influence on user  
24 experience (Hsu *et al.*, 2017). Hedonic emotions drive enthusiasm, happiness and joy,  
25 whereas utilitarian emotions stimulate users' sense of security and trust (Chitturi *et al.*,  
26 2008).  
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37 With gamification, it is assumed that utilitarian and hedonic emotions are activated when  
38 users interact with the elements of gamification (Klock *et al.*, 2018a; Koivisto and Hamari  
39 2019) because these elements provide a reward for consumers in the form of enjoyment  
40 of the experience from the hedonic side and practical functionality and rewards from the  
41 utilitarian side (Okada, 2005). Accordingly, the feedback that players receive from  
42 gamified elements such as points and badges can be interpreted as both hedonic and  
43 utilitarian rewards because real-time feedback positively reinforces any behaviour  
44 (Perryer *et al.*, 2016; Conaway and Garay, 2014; Stock *et al.*, 2015).  
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55 Moreover, according to Stock *et al.* (2014), in a co-creation context, consumers are  
56 largely driven by extrinsic (utilitarian) and intrinsic (hedonic) motives, which include  
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3 desired reciprocity, social recognition, product-related benefits and rewards (Ogawa and  
4 Pongtanalert, 2013; Yim *et al.*, 2012), fun, curiosity, and learning or skills development  
5 (Füller *et al.*, 2009; Nambisan and Baron, 2010; Stock *et al.*, 2015). That is, value co-  
6 creation processes are predicted to be driven by hedonic and utilitarian emotions.  
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11 In addition to these arguments, given that dialogue is an interactive process (Ballantyne  
12 and Varey 2006; Grönroos, 2000; Lusch and Vargo, 2006), access enables collaboration  
13 with the environment (Ojiaku *et al.*, 2020; Rajan and Read, 2016), transparency ensures  
14 that information is reliable (Schiavone *et al.*, 2014) and risk assessment allows customers  
15 to make informed choices (Mazur and Zaborek, 2014), it seems reasonable that hedonic  
16 and utilitarian emotional responses would be suitable for users to become engaged with  
17 the components of value co-creation. Accordingly, the following hypotheses are  
18 proposed:  
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31 H1: *Utilitarian mechanics positively favour the value co-creation dimensions of dialogue*  
32 *(H1a), access (H1b), transparency (H1c) and risk assessment (H1d).*  
33  
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35  
36 H2: *Hedonic mechanics positively favour the value co-creation dimensions of dialogue*  
37 *(H2a), access (H2b), transparency (H2c) and risk assessment (H2d).*  
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40 Social mechanics refer to the psychological need of human beings to experience  
41 relationships with peers (Deci and Ryan, 2000; Hamari and Koivisto, 2015b). Besides the  
42 utilitarian and hedonic characteristics of gamified systems, an aspect that commonly  
43 affects current systems is the implementation of social characteristics (Hamari and  
44 Koivisto, 2015a).  
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50  
51 Gamified platforms offer instant connections with social media, where participants can  
52 gain a sense of recognition from other users (Conaway and Garay, 2014). Hence, when  
53 social functions are deployed in a system, the social community responds to the need for  
54 relations and support even more than the core activities of the service, doing so through,  
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3 for example, the recognition and mutual benefits derived from social interaction (Hamari  
4 and Koivisto, 2013).

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7 Consistent with previous studies, Hamari and Koivisto (2015b) reported that social  
8 factors are a key antecedent of users' motivations, sustained behaviour and use intentions.  
9  
10 Xi and Hamari (2019) found that the functions of gamified systems such as messages,  
11  
12 blogs, links to social media and chats can create feelings of belonging to a group (van  
13  
14 Roy and Zaman, 2018), and cooperation can encourage players to work together towards  
15  
16 a shared goal (Sailer *et al.*, 2017; Werbach and Hunter, 2012).  
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21 Therefore, it seems reasonable that when users experience positive social emotions, their  
22  
23 willingness to participate proactively in the process of interaction increases (dialogue),  
24  
25 they have incentives to access the platform (access), they make use of information  
26  
27 supplied by the firm (transparency) and they take decisions thanks to interest shown in  
28  
29 the risk and return information provided by the firm (risk assessment). Hence, the  
30  
31 following hypotheses are proposed:  
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35 H3: *Social mechanics positively favour the value co-creation dimensions of dialogue*  
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37 *(H3a), access (H3b), transparency (H3c) and risk assessment (H3d).*  
38

39  
40 Emotional mechanics are therefore proposed as being present in gamified systems and as  
41  
42 positively influencing value co-creation processes. Firms should be aware of this  
43  
44 situation, orienting user behaviour towards value co-creation through experience. These  
45  
46 proposals form the basis for the analysis model shown in Figure I, resulting from the  
47  
48 combination of two approaches: an experience perspective in the approach to value co-  
49  
50 creation and the psychological perspective of emotions in the approach to gamification.  
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53  
54 [Insert Figure I. Analysis Model]  
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3 The study was performed by examining the Nike+ gamified digital platform. As  
4  
5 illustrated later, the elements discussed in the background section are identified with  
6  
7 gamification, value co-creation processes and the emotional states of platform users.  
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### 10 **2.5. The Nike+ application**

11  
12 Strategically, Nike has created and promoted the use of digital platforms, through which  
13  
14 the firm has built relations with customers and suppliers on a major scale, becoming a  
15  
16 pioneer in the use of digital platforms within a B2B2C ecosystem. The Nike+ running  
17  
18 application was developed under this approach. This application enables interactions of  
19  
20 runners with Nike, runners with Apple and Google, and runners with other runners and  
21  
22 with running experts (Ramaswamy, 2008). This gamified application is the result of the  
23  
24 nexus between Nike and Apple to connect runners with other runners from around the  
25  
26 world (Childs and Jin, 2018).  
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30 Strategically, Nike creates and promotes the use of digital platforms, using gameful  
31  
32 elements to provide community members with unique interactive experiences, through  
33  
34 which the firm creates links with a large number of customers and suppliers (Piskorski  
35  
36 and Johnson, 2014). In the words of Poornikoo (2014, p. 6), “Nike has converted the  
37  
38 simplest sport in the world into a gamified social sport that offers users enormous amount  
39  
40 of data about their personal achievements, which enables them to become better at  
41  
42 running and thus in a healthier lifestyle”.  
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46 The company has been able to identify and anticipate the fact that its competitive  
47  
48 advantage in the sports shoes market should be oriented at value creation through  
49  
50 experiences. Thus, through constant interaction with consumers on digital platforms,  
51  
52 Nike can discover what its customers do and do not want, whilst incorporating the ideas  
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54 of users, thereby creating a unique brand image (Ramaswamy, 2008).  
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Ramaswamy (2008, pp. 11–12) used theoretical foundations to argue that, through the Nike+ platform, Nike enables value co-creation through dialogue, access, transparency and risk assessment (DART) in the following ways:

- Dialogue exists when runners participate in almost real-time online conversations. Groups of runners can challenge one another and encourage each other as they advance towards their goals and meet their challenges.
- Access is provided to consumers through the iPod Nano/Sport kit device and the Nike+ website.
- Transparency equates to shared information.
- The Nike+ gamified platform enhances the economic value of the participation of runners by reducing their personal risk of injury. It offers suitable training methods to avoid injury.

Nike+ is a gamified digital platform (Poorniko, 2014) because it uses gameful elements that evoke emotions in consumers. It is argued that users of the Nike+ platform experience utilitarian, hedonic and social emotions when they use the application. For example:

- It offers exclusive access to the latest models, customisation of running shoes and rewards through promotions and special offers for the members of the Nike+ community.
- The website offers a range of visualisations of user performance, the ability to challenge others and a forum to discuss and share ideas (Saponas *et al.*, 2006).
- It offers participants the chance to challenge other participants. This opportunity provides huge motivation to use the application and, in turn, keeps users with a high level of drive to participate because the more active runners are, the more points they can earn, and the community will know who is at the top of the leaderboard (Poornikoo, 2014).

- It provides a participatory platform that encourages users to connect with a large community of runners (Ramaswamy and Guillard, 2010).
- It allows runners to visually map each run whilst recording pace, distance, time and calorie expenditure by motivating runners with live comments from famous figures such as Lance Armstrong during and after each run (Mercken, 2017).
- It provides ease of user experience and tries to involve customers in the design process by motivating them with their achievements and participation in an online community (Poornikoo, 2014).
- It allows users to achieve their goals by offering them a gamified service that motivates them to participate more in training exercises (Poornikoo, 2014).

Given these considerations and under the premise that Nike+ offers a digital gamified platform with the necessary characteristics to engage users in value co-creation, the proposed hypotheses on the emotional mechanics of gamification and value co-creation were tested from the user perspective.

### **3. Method**

#### **3.1. Research design and sample**

##### *3.1.1. Sample*

The empirical study was based on a sample of users of the gamified Nike+ application. The fieldwork was performed by a market research company. The sample was chosen from a consumer panel. The present study used data from self-reported measures from a one-time survey. Data were collected in September and October 2020. An online questionnaire was sent to potential respondents, giving a final sample consisting of 304 valid questionnaires.

Participation in the study was voluntary, and participants were guaranteed anonymity and data confidentiality. The dependent and independent variables were placed on different

pages of the electronic survey, which prevented respondents from inferring cause–effect relationships amongst the constructs. According to Podsakoff *et al.* (2003), this measure reduces the chances that participants will respond dishonestly or falsely.

Non-response bias was assessed. The researchers informed participants that their data would be treated confidentially. The Mann-Whitney U test was performed for early and late participants for the means of all research variables. The first 50 observations were used as early participants, and the last 50 observations were used as late participants. The results show that the significance value for the research variable was not less than 0.5, which is non-significant. Hence, there was no statistically significant difference between early and late participants. Therefore, non-response bias was not a concern in this study. Table III shows the profile of the final sample.

[Insert Table III. Sample profile]

### 3.1.2. *Measurement instruments*

The constructs of the emotional mechanisms of gamification and value co-creation were drawn from the literature. To measure the process of value co-creation through experiences, the DART model proposed by Prahalad and Ramaswamy (2004b) was used. The items and sources are shown in Table IV. A 5-point Likert scale ranging from 1 (*not at all important*) to 5 (*very important*) was used to measure the respondents' opinions for each item.

[Insert Table IV. Constructs, items and theoretical sources]

Validation of these measurement scales represents a crucial stage of empirical research. This validation was performed using analysis of the psychometric properties of the measurement scales, namely validity, reliability and dimensionality (Churchill, 1979; Anderson and Gerbing, 1988).

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3 **Content validity** was supported by the literature review of the emotional mechanics of  
4 gamification and the components of value co-creation (Table V). The analysis of the  
5 dimensionality of the proposed scales and the validation of the questionnaire through  
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10 **construct validity** was performed using exploratory factor analysis with varimax  
11 rotation. The Kaiser-Meyer-Olkin (KMO) test took the value 0.961 ( $> 0.6$ ), indicating  
12 excellent sampling adequacy. Moreover, the relationships between items were  
13 statistically significant and provided a parsimonious set of factors. The estimated  
14 communalities ranged from 0.587 to 0.869 for the different items, so the variables  
15 adequately fit the estimated factor structure (Hair *et al.*, 2006). In addition, Bartlett's test  
16 of sphericity, which took a value greater than 0.3, reflected the relationship between the  
17 measurement items and suggested that the data were appropriate for exploratory factor  
18 analysis (Hair *et al.*, 2006).

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30 For the analysis of **reliability** of the measurement scales, internal consistency analysis  
31 was performed using Cronbach's alpha. The value of Cronbach's alpha (0.958) indicates  
32 adequate reliability (Nunnally, 1978). This value did not improve after eliminating any  
33 of the items. All items loaded strongly on the expected constructs, with composite  
34 reliability ranging from 0.862 to 0.950. These values are greater than the recommended  
35 value ( $> 0.7$ ) and suggest a satisfactory level of reliability (Bagozzi and Yi, 1988; Hair *et*  
36 *al.*, 2006).

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47 **Discriminant validity** was tested using exploratory factor analysis. The average variance  
48 extracted (AVE) was examined for each research construct and compared with the  
49 squared correlation between the constructs (Fornell and Larcker, 1981). The results show  
50 that the AVE for each construct ranged from 0.749 to 0.868, and the items represent a  
51 distinctive underlying concept. An AVE value of 0.5 or higher reflects adequate  
52 convergent validity.  
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To address **multicollinearity**, the established procedures were followed to mean-centre related variables prior to generating proposed interaction terms to test the hypotheses.

Table V presents the results of the analysis of the measurement instruments.

[Insert Table V. Descriptive statistics, reliability and factor loadings]

### 3.2. Data analysis and results

Structural equation modelling (SEM) in AMOS 19 software was used to test the proposed model. SEM is suitable for the proposed model structure, given the hypothesised relationships between the variables, with a large number of latent variables and indicators (Hair *et al.*, 2006). The sample size was also suitable for this analysis. The procedure followed the structure proposed by Foroudi *et al.* (2017) for SEM-based methods.

In two phases, the measurement and structural models were obtained using SEM. In the first stage, the measurement model was tested to identify the causal relationships between variables (observed items) and latent constructs (unobserved). The second stage (structural model) was tested using regression paths, which explain the causal associations between the observed constructs (Anderson and Gerbing, 1988).

To evaluate the model's fit to a baseline model, the root mean squared approximation of error (RMSEA) absolute fit index and the incremental fit indices of the normed fit index (NFI), non-normalised fit index (NNFI), comparative fit index (CFI) and incremental fit index (IFI) were used (Byrne, 2006; Hair *et al.*, 2006). The parsimonious goodness of fit index (PGFI) was also used (James, Mulaik and Brett, 1982; Mulaik, *et al.*, 1989). The values observed for each index are shown in Table VI.

[Insert Table VI. Goodness of fit measures]

The value for the RMSEA was 0.063 (< 0.08), which indicates an acceptable overall fit. That is, the model is capable of predicting the matrix of initial data. The incremental fit indices compare the estimated model with a model in which the variables are unrelated.

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3 The NFI compares the proposed model and the null model considering an acceptable  
4 value (0.946 > 0.90). The NNFI, or Tucker Lewis index, overcomes the limitations of the  
5 NFI by considering the degrees of freedom of the proposed model, provided its  
6 relationship with sample size is weak. This index ranges from 0 to 1, with a recommended  
7 value greater than or equal to 0.9 (here 0.957). The value for the CFI (0.962 > 0.90)  
8 indicates a good fit. This incremental fit index estimates the fit of the model with the null  
9 baseline model. Finally, the IFI took a value of 0.989, which is greater than the  
10 recommended threshold of 0.90, thereby illustrating the adequate fit of the measurement  
11 model. The PGFI is a modified version of the goodness of fit index (GFI) and considers  
12 the degrees of freedom to test the model. Acceptable values for this index lie in the range  
13 0.5 to 0.7. In this case, the value was 0.506. The findings for the confirmatory factor  
14 analysis reveal adequate fit.

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31 The second stage of the analysis, the structural model, was performed using regression  
32 path analysis. This analysis explains the causal association between the observed  
33 constructs. The research hypotheses were examined from the standardised estimate and  
34 *t*-value or critical ratio (Anderson and Gerbing, 1982; Chau, 1997). The hypothesis testing  
35 was performed using standardised paths, which were estimated using a bootstrapping  
36 procedure with 5,000 subsamples (Chin, 1998).

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H1a proposes that the utilitarian emotional mechanics of gamification encourage dialogue  
in value co-creation through user experience on the gamified sporting application ( $b =$   
 $0.152$ ,  $p = 0.452$ ). H1b proposes that utilitarian emotional mechanics encourage access in  
value co-creation ( $b = 0.928$ ,  $p = 0.004$ ). H1c proposes the positive impact of utilitarian  
mechanics on transparency in value co-creation ( $b = 0.414$ ,  $p = 0.246$ ). H1d proposes the  
positive impact of utilitarian mechanics on the perception of risk as a component of value  
co-creation ( $b = 0.305$ ,  $p = 0.331$ ). For this group of emotional mechanics, only the

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3 hypothesis H1b, related to access as a component of value co-creation, is supported. The  
4  
5 hypotheses H1a, H1c and H1d are not supported.

6  
7 H2a proposes that the hedonic emotional mechanics of gamification promote dialogue in  
8 value co-creation through user experience on the gamified sports application ( $b = 0.063$ ,  
9  $p = 0.346$ ). H2b proposes that hedonic emotional mechanics promote access in value co-  
10 creation ( $b = 0.862$ ,  $p = 0.000$ ). H2c proposes the positive impact of hedonic mechanics  
11 on transparency in value co-creation ( $b = 0.058$ ,  $p = 0.0605$ ). H2d proposes the positive  
12 impact of hedonic mechanics on the perception of risk as a component of value co-  
13 creation ( $b = 0.066$ ,  $p = 0.496$ ). For this group of hedonic mechanics, only the hypothesis  
14 H2b, related to access as a component of value co-creation, is supported, echoing the  
15 result for utilitarian mechanics. The hypotheses H2a, H2c and H2d are not supported.

16  
17 H3a proposes that the social emotional mechanics of gamification promote dialogue in  
18 value co-creation through user experience on the gamified sporting application ( $b = 0.835$ ,  
19  $p = 0.000$ ). H3b proposes that social emotional mechanics promote access in value co-  
20 creation ( $b = 0.962$ ,  $p = 0.002$ ). H3c proposes the positive impact of social emotional  
21 mechanics on transparency in value co-creation ( $b = 1.404$ ,  $p = 0.000$ ). H3d proposes the  
22 positive impact of social mechanics on the perception of risk as a component of value co-  
23 creation ( $b = 1.280$ ,  $p = 0.000$ ). For this group of social mechanics, all hypotheses are  
24 supported. The standardised regression paths for H3a, H3b, H3c and H3d are statistically  
25 significant.

26  
27 The findings for the causal paths in the form of standardised path coefficients ( $b$ ), standard  
28 errors,  $t$ -values,  $p$  values and hypothesis results corresponding to the hypothesised SEM  
29 paths are presented in Table VII.

30  
31 [Insert Table VII. Results of hypothesis testing]

#### 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

**4. Findings and discussion**



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3 The empirical analysis focused on the users of a gamified platform that allowed them to  
4 participate in a B2B2C ecosystem. The results show the importance of the emotional  
5 mechanics of gamification (utilitarian, hedonic and social) in the components of value co-  
6 creation. The results highlight the role of social emotions as the most influential emotions  
7 in engaging users in co-creative processes. Specifically, the results confirm that social  
8 mechanics positively influence all dimensions of the DART model, namely dialogue,  
9 access, risk assessment and transparency. This finding emphasises the importance of  
10 ensuring that digital platforms encourage social interactions (Parker et al., 2016).

11  
12 The findings are consistent with those of previous studies. The theoretical arguments of  
13 Ramaswamy (2008) are empirically validated by this study, which shows that value co-  
14 creation processes occur when social relationships exist. These findings are also in line  
15 with those of Koivisto and Hamari (2014) and Hamari and Koivisto (2015b), who found  
16 that social influence plays a major role in engaging new users. Mathwick and Mosteller  
17 (2017) also confirmed that users value social interaction and that public recognition  
18 benefits co-production. In short, the results empirically illustrate the power of social  
19 emotions to engage users in the co-creation of value. The results thus validate the  
20 proposals of Dellaert (2019) that new digital technologies can help consumers not only  
21 to satisfy their own needs but also to create greater value for other consumers, thus  
22 strengthening a company's competitive position (Wernerfelt, 1994).

23  
24 Many authors have reported that gamified systems meet both utilitarian and hedonic  
25 needs (Hamari and Keronen, 2017; Kovisto and Hamari, 2019). The question is whether  
26 these emotions are enough to engage users in co-creative processes. **Based on the**  
27 **theoretical frameworks on gamification, utilitarian and hedonic emotional mechanics**  
28 **were expected to influence all value co-creation components. However,** the results of this  
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3 study show a positive impact only in the case of the access dimension of value co-  
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5 creation. The impact on the other dimensions is not confirmed.  
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7  
8 These findings are especially revealing. The results confirm that utilitarian and hedonic  
9  
10 emotions are necessary as a starting point to initiate the value co-creation process. Access  
11  
12 refers to the degree to which a company gives its customers experiences at multiple  
13  
14 interaction points. In order for users to experience a service, it is essential to facilitate  
15  
16 access (Jaakkola and Alexander, 2014) and awaken feelings of utility and pleasure so that  
17  
18 the experience is productive, pleasant and rewarding (Füller, 2010). Access is therefore  
19  
20 necessary to initiate co-creation. This conclusion confirms the suggestions in the literature  
21  
22 that utilitarian products should be accessible at any time and place through multiple  
23  
24 channels (Liao and Cheung, 2002) and that service design should contemplate ease of  
25  
26 use, operational interaction, navigation and download speed (Elradi *et al.*, 2017; Hung *et*  
27  
28 *al.*, 2021).  
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32  
33 In line with the findings of Hung *et al.* (2021), this study confirms that utilitarian emotions  
34  
35 are aroused as a result of a company's ability to allow its users to achieve their aims when  
36  
37 using the platform. In other words, utilitarian emotions encourage users to participate in  
38  
39 the co-creation of value thanks to the ease of access.  
40

41  
42 In terms of hedonic emotions, the results support the research by Tu and Zhang (2013)  
43  
44 by showing that hedonic emotions are related to enjoyment in the use of the platform. The  
45  
46 results are closely related to those reported by Talonen *et al.*, (2016), showing that  
47  
48 hedonic emotions are made up of social value. The results are also related to the  
49  
50 conclusions of De Oliveira *et al.*, (2020, p. 1213): "Customer engagement, as intrinsic  
51  
52 motivation, implies that consumers are driven by desires to interact and cooperate with  
53  
54 'community members' (Algesheimer *et al.*, 2005, p. 21) or participate in 'an online brand  
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community' (Baldus *et al.*, 2015, p. 979)." For this purpose, users must enjoy the access offered by the platform.

In summary, the results confirm that to involve users in value co-creation, utilitarian and hedonic emotions must be used as antecedents to social emotions. These social emotions are ultimately what exert the greatest driving force for users to engage in value co-creation.

Nike has recognised that the participation of stakeholders is necessary for a product to achieve its expected results (Dreyer *et al.*, 2017). By including customers in the value co-creation process, Nike can gain a better understanding of customer needs and can focus on inventing new innovative approaches to generate change (Boaz *et al.*, 2018). Therefore, it is especially important to know what drives users to collaborate in the value co-creation process.

These findings are of particular interest in that they offer a blueprint for the successful design of value co-creation environments. These findings highlight the need for firms to strengthen the social mechanics of gamified systems related to the user experience to the extent that they positively influence the components of value co-creation.

## 5. Conclusions

One of the current research trends is driven by the need to implement methodologies that help firms develop their goods and services to ensure that they meet the expectations of their customers, whilst making customers feel that the company's products have been created just for them (Merhabi *et al.*, 2021). This trend leads to a focus on value co-creation, such that both firms and their customers participate and benefit from the joint creation of value. In B2B2C ecosystems, co-creation is necessary and high priority.

The constant evolution of e-commerce has forced firms to seek innovative business models to collect and integrate information from electronic markets. B2B2C ecosystems

1  
2  
3 enable firms to broaden their range of products and services by integrating information  
4  
5 (Gou *et al.*, 2018).  
6

7  
8 Accordingly, digital platforms have made it possible for firms, suppliers and consumers  
9  
10 to gain direct access to the information provided by consumers uniquely and efficiently.  
11  
12 Therefore, they are believed to offer an opportunity not only for the large companies that  
13  
14 own the platform but also for all of the platform's stakeholders. Digital platforms offer a  
15  
16 space for interaction, whilst gamification provides incentives to make this interaction  
17  
18 effective.  
19

20  
21 This study used a quantitative approach to investigate how the utilitarian, hedonic and  
22  
23 social emotional mechanics of gamification influence value co-creation through user  
24  
25 experience on gamified digital platforms. The Nike+ platform offers an example of a  
26  
27 B2B2C ecosystem. This platform provided a reference for the analysis in the present  
28  
29 study. The findings have valuable theoretical and practical implications.  
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### 32 33 **5.1. Theoretical contributions**

34  
35 First, the study extends knowledge of the relationship between gamification and value co-  
36  
37 creation processes, thereby responding to calls from other researchers to examine this link  
38  
39 (Merhabi, Petridis and Khusainova, 2021; Patrício *et al.*, 2020). The study provides  
40  
41 theoretical foundations for “co-created gamification methodology” expounded by  
42  
43 Rodrigues *et al.* (2020) by combining the focus on value co-creation through experience  
44  
45 with the psychological perspective of emotions in gamification. As explained in this  
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47 paper, value co-creation and gamification have the common feature that users' emotional  
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49 states influence the effective development of both processes. Therefore, arguments are  
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51 provided here to justify the combination of these two approaches when considering the  
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53 role of emotions.  
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3 Second, to the best of the authors' knowledge, this paper describes a pioneering study in  
4 the sense that it empirically examines how the emotional mechanics of gamification  
5 influence co-creation processes. It is well known that games have an innate capacity to  
6 attract and excite and that, when people play games, they experience emotions that lead  
7 them to continue participating and modify their behaviour (Huotari and Hamari, 2017;  
8 Ryan *et al.*, 2006; Deci and Ryan, 2000; Ryan and Deci, 2000; Venkatesh, 1999; Webster  
9 and Martocchio, 1992; Csíkszentmihályi, 1975, 1990; Kovisto and Hamari, 2019).  
10 However, no research has studied how these emotions can be harnessed to direct  
11 behaviour towards value co-creation. For years, the literature has called for studies in this  
12 area. In answering these calls, the present study offers a major advance in this sense.

13  
14  
15 Third, the study makes advances in the understanding of value co-creation processes from  
16 the consumer perspective, thereby enhancing the field of knowledge in relation to  
17 research on value co-creation through experience (Cheng *et al.*, 2012). The current study  
18 also contributes to the literature through its practical application of the DART model,  
19 given that most studies that have used this model for empirical analysis have treated the  
20 components of co-creation as independent variables (Mukhtar, 2017; Ojiaku *et al.*, 2020;  
21 Zaborek and Mazur, 2017). In the current study, dialogue, access, transparency and risk  
22 assessment are treated as dependent variables, which represents a fresh contribution to  
23 understanding value co-creation processes.

24  
25  
26 Finally, in B2B context, gamification as an enabler of cocreation is an emerging topic,  
27 and more insights are needed on how gamification can facilitate co-creation of services  
28 by channel partners (de Jong *et al.*, 2021). The theoretical framework of this study is not  
29 restricted to the perspective of the consumer and can be adopted by the field of marketing  
30 B2B services.

## 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60

**5.2. Practical contributions**

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3 The findings also have interesting practical implications. According to Johannessen *et al.*  
4  
5 (1999), the information gathered through social interaction provides valuable customer  
6  
7 knowledge that can drive technological and product innovations. The present study  
8  
9 provides guidance for companies in the design of their gamified systems by showing that  
10  
11 the emotional responses of consumers are particularly important to ensure that they are  
12  
13 engaged in social interaction. Hence, the importance of the collection of information by  
14  
15 firms is clear.  
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18  
19 The literature explains that co-creation offers strategic benefits for companies and  
20  
21 customers (Cossío-Silva *et al.*, 2015; Navarro, Llinares, and Garzon, 2016; Tseng and  
22  
23 Chiang, 2015; Vargo and Lusch, 2015). Therefore, studies that examine how users'  
24  
25 emotions influence value co-creation processes can help organisations focus on the  
26  
27 psychological aspects of this process.  
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30  
31 The results of this study confirm that when users experience utilitarian, hedonic and social  
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33 emotions from participating in gamified digital platforms, thus affecting some of the  
34  
35 components of value co-creation, this situation can help firms operating in B2B2C  
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37 contexts focus their efforts on evoking these emotions to direct user behaviour towards  
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39 value co-creation processes. Thus, given that social emotions are drivers of value co-  
40  
41 creation, the designers of gamified systems should ensure that their platforms allow  
42  
43 effective social interactions. The study also shows that utilitarian and hedonic emotions  
44  
45 exert an influence in the case of access to information, which is something that firms  
46  
47 should ensure that they provide so that they can succeed in value co-creation. This finding  
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49 reveals the importance of developing platforms that enable access in an attractive and  
50  
51 appropriate manner so that consumers feel comfortable and driven to continue using the  
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53 platform. Only thus can consumer behaviour be directed towards co-creative processes.  
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Specifically, as a result of the technological development and opportunities presented by the Internet, digital platforms are becoming increasingly integrated into B2B2C ecosystems. The assertions of Poornikoo (2014) have been confirmed in the sense that Nike+ is a gamified platform that has enabled the participation of consumers in co-creation processes. This case offers a clear example of how a company, through a gamified digital platform, has gone from selling running shoes to co-creating experiences with the Nike+ application (Brunello, 2014).

In short, there is no doubt that the arrival of online services where users can communicate with others from anywhere in the world has created major opportunities for all stakeholders of the B2B2C ecosystem and that the emotional responses of users drive behaviour. Therefore, organisations should focus more on evoking emotions than on meeting needs because these needs go hand in hand with emotions.

### 5.3. Limitations and future research

This study has certain limitations. First, the study was performed from a consumer perspective, thereby capturing the perceptions of one specific part of the B2B2C ecosystem. It would also be of interest to analyse the perspectives of other agents involved in the development of co-creative processes. Second, the context in which the study was applied was limited to users who enjoy running. This limitation restricted the study to an entertainment environment. Future studies could compare how emotional states influence value co-creation in different contexts. **For example, in B2B context, this study provides many opportunities to be replicated in this environment and confirm whether emotions improve the service experience between partners.** Third, this study did not address the impact on business performance. Numerous scholars have noted that co-creation stimulates organisational performance (Heinonen *et al.*, 2010). Therefore, in line with the work of Liu and Wang (2019), future studies could validate whether emotions exert an

influence on the relationship between value co-creation and business performance.

Finally, the effectiveness of co-creation may change over time (Kim *et al.*, 2020).

Longitudinal studies are suggested to capture how changes in emotional states influence value co-creation processes over time.

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Figure I. Analysis Model

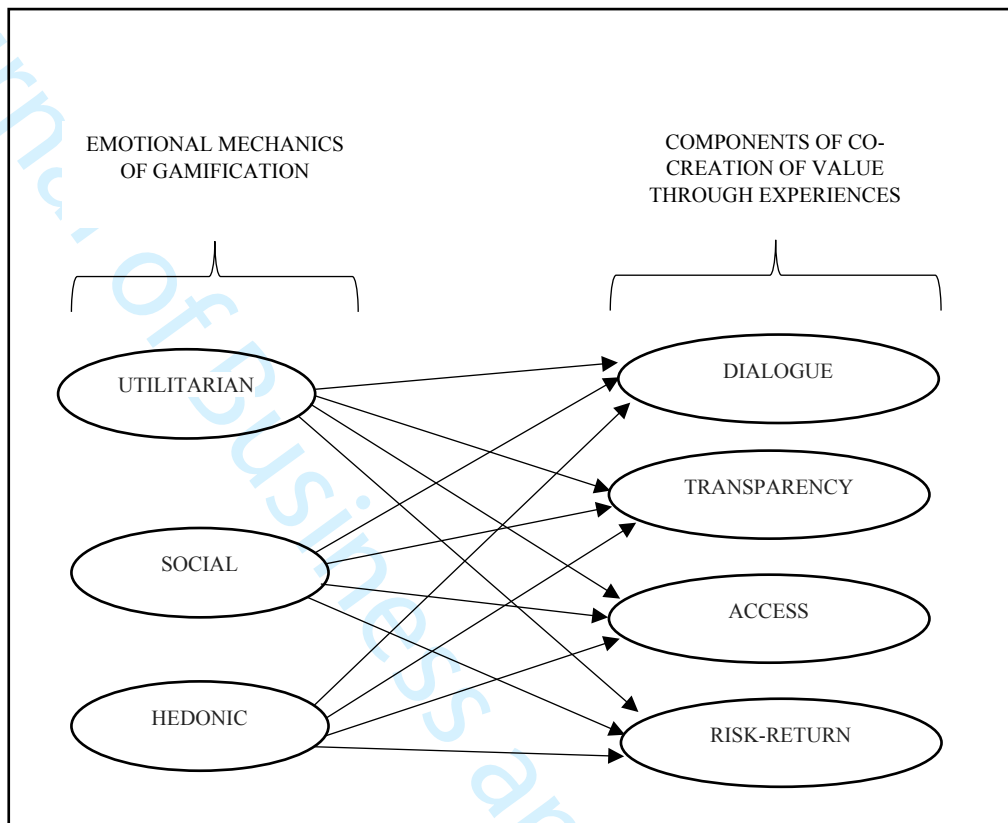




Table I. Main approaches to value co-creation

Approaches to co-creation of value	Consumer-Companies co-create when...
Service-Dominant Logic (Vargo and Lusch, 2004)	Customers use products or services
Logic Service (Grönroos, 2006)	Interactions
Through Experience (Prahalad and Ramaswamy, 2004a, b)	Share experiences

Table II. Psychological perspective in gamification

Perspectives	Framework
Self-Determination Theory (Ryan and Deci, 2000a)	Autonomy, competence and social relatedness
Intrinsic and Extrinsic Motivation (Ryan and Deci, 2000b)	Intrinsic motivation refers to sources of motivation inherent to a behaviour Extrinsic motivation refers to motivation external to the behaviour
Flow Theory (Csikszentmihalyi, 1990)	Mental state in which a person performing some activity is fully immersed in a feeling of energized focus, full involvement, and enjoyment in the process of the activity
Mechanics, Dynamics, and Emotions (Mullins <i>et al.</i> , 2020)	Cognitive and emotional perspective of gamification that explains how the mechanics of the game can interact with emotion and cognition to produce the desired outcomes.

Table III. Sample profile

Variable	Category	Percentage (%)
Gender	Male	52%
	Female	48%
Age	< 20 years	16.1%
	20–29 years	22.4%
	30–39 years	22.0%
	40–49 years	21.1%
	> 50 years	18.4%
Weekly exercise	< 6 times a week	30.9%
	6–10 times a week	54.3%
	> 10 times a week	14.8%



Table IV. Constructs, items and theoretical sources.

<i>Emotional Mechanics of Gamification</i> (Conaway & Garay, 2014; Liu <i>et al.</i> , 2019)	
Utilitarian	
GA_1	When I overcome a challenge, I receive some kind of satisfying reward.
GA_2	Receiving rewards encourages me to continue participating.
GA_3	The more I participate, the more chance I have of receiving a reward.
GA_4	I feel like I get special treatment for using the application.
Hedonic	
GA_5	I enjoy overcoming the challenges set by the application.
GA_6	The content offered by the application encourages me to keep participating.
Social	
GA_7	The application appeals to me because it lets me compete with other users.
GA_8	I like to share my achievements and progress with other users.
<i>Co-creation</i> (Pralhad & Ramaswamy, 2004; Albinsson, Yasanthi, & Pookie, 2016)	
Dialogue	
CO_1	Through the application, I provide information to the company about my tastes and preferences.
CO_2	Through the application, the company actively promotes a dialogue with customers to learn more about their needs, what they want and how they want it.
CO_3	The application enables the exchange of ideas with other users.
Access	
CO_4	The application gives users a range of options to decide how to live the sporting experience.
CO_5	The application provides access to privileged information about new products or company events.
Transparency	
CO_6	The application provides customers with useful information to improve the results of the sports experience.
CO_7	The application gives customers information about the prices of products and services linked to the sports experience.
Risk Assessment	
CO_8	The application allows you to evaluate all the positive and negative factors associated with the sporting experience.
CO_9	The application provides customers with the necessary tools to make fully informed decisions about whether or not to participate in the sports experience.

Table V. Descriptive statistics, reliability and factor loadings

Construct	Cronbach's alpha	Items	EFA final loading	Mean	SD	AVE	Construct reliability = composite reliability
Utilitarian gamification	0.885	G1	0.881	3.14	1.234	0.7490565	0.922391949
		G2	0.885	3.34	1.305		
		G3	0.922	3.20	1.313		
		G4	0.766	3.07	1.346		
Hedonic gamification	0.758	G5	0.898	4.11	0.979	0.806404	0.950212212
		G6	0.898	4.03	9.915		
Social gamification	0.822	G7	0.923	3.17	1.342	0.851929	0.920044991
		G8	0.923	3.19	1.207		
Value co-creation dialogue	0.852	C1	0.896	3.10	1.339	0.771685667	0.910208716
		C2	0.879	3.04	1.293		
		C3	0.860	3.19	1.207		
Value co-creation access	0.681	C4	0.871	3.91	0.937	0.758641	0.862758232
		C5	0.971	3.81	1.007		
Value co-creation transparency	0.793	C6	0.910	3.15	1.303	0.8281	0.905967945
		C7	0.910	3.13	1.296		
Value co-creation risk	0.849	C8	0.932	3.13	1.159	0.868624	0.929693721
		C9	0.932	3.18	1.169		

Notes: SPSS v.25 was used for all statistical analyses; EFA = exploratory factor analysis; AVE = average variance extracted.

Table VI. Goodness of fit measures

Goodness of fit measures	Acceptable Fit Index	Value obtained
<i>Absolute Fit Index</i>		
RMSEA	<0.8	0.063
<i>Incremental Fit Index</i>		
NFI	>0.9	0.946
NNFI	>0.9	0.957
CFI	>0.9	0.962
IFI	>0.9	0.989
<i>Parsimonious Goodness of Fit Index</i>		
PGFI	0.5<PGFI<0.7	0.506

Table VII. Results of hypothesis testing

	Path	b	S.E.	t-value	p	Hypothesis
H1a	GA Utilitarian → CO Dialogue	0.152	0.202	0.751	0.452	Rejected
H1b	GA Utilitarian → CO Access	0.928	0.322	2.883	0.004**	<b>Accepted</b>
H1c	GA Utilitarian → CO Transpar.	0.414	0.357	1.160	0.246	Rejected
H1d	GA Utilitarian → CO Risk	0.305	0.314	0.972	0.331	Rejected
H2a	GA Hedonic → CO Dialogue	0.063	0.066	0.943	0.346	Rejected
H2b	GA Hedonic → CO Access	0.862	0.120	7.208	0.000***	<b>Accepted</b>
H2c	GA Hedonic → CO Transpar.	0.058	0.113	0.518	0.605	Rejected
H2d	GA Hedonic → CO Risk	0.066	0.098	0.680	0.496	Rejected
H3a	GA Social → CO Dialogue	0.835	0.202	4.128	0.000***	<b>Accepted</b>
H3b	GA Social → CO Access	0.962	0.312	3.085	0.002**	<b>Accepted</b>
H3c	GA Social → CO Transpar.	1.404	0.358	3.921	0.000***	<b>Accepted</b>
H3d	GA Social → CO Risk	1.280	0.317	4.035	0.000***	<b>Accepted</b>

Notes: path = relationship between independent variable and dependent variable; b = standardised regression coefficient; S.E. = standard error; p = level of significance; \*\*\*p < 0.001, \*\*p < 0.01, \*p < 0.05; GA = gamification; CO = value co-creation.