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Summary

Academics and practitioners acknowledge the relevance of integrating customers in the development of new products and recommend the use of new technologies to this end. However, though they play an important role, the development of an online platform is not sufficient for effective engagement of customers, yet considered as a key predictor of successful co-creation initiatives. Despite the large body of research regarding value co-creation, little is known about how to design interactive platforms to engage consumers. To address this gap, based on an in-depth case study including longitudinal data and rich qualitative material, this research investigates the impact of two gamification mechanics: cooperation and competition. This research highlights the existence of four user profiles. We then assess their emotional, cognitive and behavioral engagement with the gamified co-creation platform over time.

Keywords: gamification; co-creation; longitudinal study; online platform; users’ profiles.

JEL Classification: M31, O31

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INVESTIGATION OF USERS’ PROFILES ON A GAMIFIED CO-CREATION PLATFORM

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Accepted (Day Month Year)

Academics and practitioners acknowledge the relevance of integrating customers in the development of new products and services in terms of innovation and relationship management (Bogers et al., 2010; Hong and Wang, 2011; Nishikawa et al., 2013; Roser et al., 2013). Engaging customers in the value co-creation process is advocated as a powerful means of establishing a dialogue with them (Varey and Ballantyne, 2006), developing a community around the firms’ interests (Healy and McDonagh, 2013), strengthening the

1. Introduction

Academics and practitioners acknowledge the relevance of integrating customers in the development of new products or services in terms of innovation and relationship management (Bogers et al., 2010; Hong and Wang, 2011; Nishikawa et al., 2013; Roser et al., 2013). Engaging customers in the value co-creation process is advocated as a powerful means of establishing a dialogue with them (Varey and Ballantyne, 2006), developing a community around the firms’ interests (Healy and McDonagh, 2013), strengthening the
commitment toward the new offering, and stimulating positive perceptions and attitudes from customers (Nishikawa et al., 2013), which can boost adoption rates and generally seem to considerably reduce the risk of innovation failure (Nambisan and Baron, 2007). The emergence of online platforms, communities and social networks has been widely recognized as facilitating the interactions and the exchange of resources among actors (Sawhney et al., 2005; Zwass, 2010). However, even if these platforms play an important role (Nambisan and Baron, 2009), they are not sufficient for effective engagement of customers, yet considered as a key predictor of successful co-creation experiences (Brodie et al., 2011; Zheng et al., 2011). Consumer engagement (CE) is defined as the level and intensity of the relationship customers develop with a focal object, such as a brand, community or process (Brodie et al., 2011). Described as a dynamic and iterative process of interactions, CE generates cognitive, emotional and behavioral manifestations (Hollebeek, 2010; Brodie et al., 2011). Engaged consumers are more willing to promote, advocate, collaborate and share their knowledge with companies. They also tend to develop long-term relationships with companies (Kumar et al., 2010).

Several authors have noted the key role played by interactive platforms in engaging consumers (Sharma and Sheth, 2004; Sawhney et al., 2005; Bell and Loane, 2010; Kaplan and Haenlein, 2010). Ramaswamy and Gouillart (2010) and Storbacka et al. (2016) use the term “engagement platform” to describe such online interfaces. The platform design performs a key role in CE because it enables firms to provide a compelling co-creation experience to customers and consequently create, maintain and develop CE (Kohler et al., 2009; Füller et al., 2011b; Brodie et al., 2013; Jaakkola and Alexander, 2014). Despite the growing body of research regarding value co-creation (Prahalad and Ramaswamy, 2004; Vargo and Lusch, 2004) and CE (van Doorn et al., 2010; Brodie et al., 2011; Vivek et al., 2012), little is known about how to design interactive platforms to engage consumers in the value co-creation process (Breidbach et al., 2013; Djelassi and Decoopman, 2013; Ostrom et al., 2015). Recent studies have called for further investigation of mechanisms that could be used to create, maintain and boost CE (Brodie et al., 2013; Djelassi and Decoopman, 2013; Breidbach et al., 2014; Jaakkola and Alexander, 2014; Ostrom et al., 2015). Among the multiple mechanisms that might be implemented to design engagement platforms, managers and researchers have called for the use of gamification (Gartner, 2011; Robson et al., 2014; Harwood and Garry, 2015).

Gamification is defined as “the use of game design elements in non-game contexts” (Deterding et al., 2011). It has recently emerged as one of the most popular practices used by companies to manage their co-creation platforms to engage customers, especially in online contexts (Zichermann and Cunningham, 2011; Werbach and Hunter, 2012; Zichermann and Linder, 2013). For instance, Gartner (Gartner, 2011, 2012) predicts that in 2015, more than 50% of organizations will use gamification to manage their innovation processes and more than 70% of Global 2000 Organizations will use at least one gamified application for business purposes. This managerial interest is also reflected in the research field. Because the connection between experience and users is the root of engagement (Robson et al., 2014), gamification seems to be a fruitful alternative, given that it provides users with an enjoyable experience and consequently generates engagement (Zichermann and Cunningham, 2011; Robson et al., 2014). Gamification has found applications in
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multiple domains, such as e-commerce (Insley and Nunan, 2014), healthcare (Drell, 2014) and intra-organizational management (Farzan and Brusilovsky, 2011).

Whereas gamification mechanics, which are defined as a game structure, goals and rules, are a priori determined by the game designers, the behaviors and emotions that a game generates are difficult to predict. Consequently, the key issue for designers resides in their capabilities to develop mechanics that generate the intended emotions and behaviors (Robson et al., 2015). However, despite the increased use of gamification mechanics for the purposes of innovation, it is still unclear how they influence CE (Hamari et al., 2014). Lucassen and Jansen (2014) have called for a better understanding and appropriate management of gamification mechanics. However, the literature related to this emerging concept remains conceptual, and there is a lack of empirical studies analyzing the impact of gamification mechanics on user engagement (Hamari et al., 2014; Robson et al., 2014). Although recent work by Harwood and Garry (2015) and Robson et al. (2014) has provided some initial valuable insights, the authors do not consider the heterogeneity of users’ profiles and consequently the different reactions users exhibit to a given gamification mechanic. CE is characterized by its intensity and its dynamic nature which cannot be captured by measuring CE at one specific point in time. This approach has been overused in previous studies (Brodie et al., 2011). The longitudinal design therefore seems to be more appropriate to better learn about how the intensity of CE evolves over time (Brodie et al., 2011; Hollebeek, 2011). Our study aims to address this important gap, and to our knowledge, it is among the first empirical studies to adopt a longitudinal perspective, which is necessary to capture the iterative and dynamic nature of CE while overlooking the cognitive dimension, which remains an important aspect, especially in the specific context of new product development (e.g., Von Hippel and Katz (2002); Vernette and Hamdi-Kidar (2013)).

To address these gaps, our research attempts to offer a more fine-grained understanding of the role that gamification mechanics plays in engaging actors in co-creation platforms. In particular, with this study, we seek to investigate the following questions:

• What are the profiles of users based on their behaviors on a gamified co-creation platform?

• How do users’ profiles predict current and future users’ emotional, cognitive and behavioral engagement?

Multiple gamification mechanics exist, but in this study, two of them – cooperation and competition – will be studied deeply. Within an innovation context, these two mechanics are widely used to design online co-creation platforms (Bullinger et al., 2010a; Füller et al., 2011a). The competition mechanics consists of one player or group winning and the others losing, whereas the cooperation mechanics relies on players collaborating to achieve a common goal (Werbach and Hunter, 2012). To empirically address the aforementioned questions, we use an in-depth case study, including longitudinal data and rich qualitative
material. We first highlight the existence of multiple user profiles. We then assess users’ emotional, cognitive and behavioral engagement with the gamification mechanics used, competition and cooperation mechanics. Our study contributes to the extant literature because it emphasizes four user profiles, i.e., invisible users, competitors, cooperators and coopetitors. Furthermore, adopting a longitudinal perspective helps us to better capture the dynamics of CE over time across the various profiles and study their respective reactions to the gamification mechanics.

The subsequent section presents the theoretical background regarding CE in the value cocreation literature in addition to the literature regarding gamification mechanics and its impact. Next, we describe the two steps of our analysis, profile identification and engagement evaluation, including the data collection, analysis and results. We close by discussing the results, future research opportunities, and managerial implications.

2. Theoretical background

2.1. Customer Engagement (CE)

The concept of CE lies within the broader domain of relationship marketing (RM) (Vivek et al., 2012). Indeed, a large part of RM focuses on the customer behaviors that result from positive experiences and eventually lead to customer loyalty (Dick and Basu, 1994; Pritchard et al., 1999). However, in addition to this approach, the CE concept also includes customer relationships beyond transactions, i.e., when customers do not purchase or plan their purchases (Vivek et al., 2012). Consistent with this approach, van Doorn et al. (van Doorn et al., 2010) defined CE as “the customers’ behavioral manifestation toward a brand or firm, beyond purchase, resulting from motivational drivers”. These manifestations include actions such as generating positive word-of-mouth, suggesting recommendations or supporting other customers.

To extend the scope of this definition focusing on customers’ behaviors, Brodie et al. (Brodie et al., 2011) performed an extensive analysis of the literature and defined CE as “a psychological state that occurs by virtue of interactive, co-creative customer experiences with a focal agent/object (e.g., a brand) in focal service relationships”. The authors describe CE as a dynamic and iterative process of interactions encompassing cognitive, emotional and behavioral manifestations (Hollebeek, 2010; Brodie et al., 2011). The cognitive dimension refers to the level of customer concentration toward the engagement focal object. The emotional dimension includes customers’ sense of belonging to the brand, organization or community. Finally, the behavioral dimension encompasses two subdimensions. First, the vigor refers to a customer’s energy level and mental resilience in interacting with the engagement focal object. Second, the interaction level reflects the twoway communication intensity (Brodie et al., 2011). The iterative nature of the process implies that relational concepts such as commitment, trust, self-brand connection, or loyalty may act as antecedents and consequences of CE (Brodie et al., 2011).

Within virtual contexts, the CE concept provides particularly a useful means of understanding how firms and customers interact to co-create value (Breidbach et al., 2014;
According to Kuo and Feng (2013), who studied virtual interactive consumer experiences, four categories of value can be derived from CE. First, the learning or cognitive value refers to the knowledge and information that customers can obtain from their interactions (Dholakia et al., 2004; Nambisan and Baron, 2009). Second, social values encompass improvements in social relationships, with other actors (firms or other customers) taking part in the interactions (Nambisan and Baron, 2009; Yen et al., 2011). Third, the self-esteem values reflect the enhancement of the reputation and status that can be derived through the interactions (Dholakia et al., 2004; Nambisan and Baron, 2009; Yen et al., 2011). Finally, the hedonic values characterize the pleasure resulting from interacting with other people (Dholakia et al., 2004; Nambisan and Baron, 2009). Consequently, by engaging their resources (time, knowledge or social capital) in the innovation platform, customers generate multiple types of value for themselves. Therefore, they become part of a value co-creation process (Prahalad and Ramaswamy, 2004) in which they interact to provide resources, integrate the resources provided by others and generate their own value (Ballantyne, 2004; Grönroos, 2008, 2012).

2.2. Gamification

During the past decade, the use of game design elements has rapidly been used by practitioners to design non-game contexts and for marketing purposes (Deterding et al., 2011; Zichermann and Cunningham, 2011; Huotari and Hamari, 2012). This enhancement of the customer experience with game elements has been referred to as gamification. Gamification has already been applied in several areas, including community management (Create and Share from Lego), health care (Nike Plus) and even as a tool for people to track their own aspirations in life (Mindbloom) (Hamari, 2013; Zichermann and Linder, 2013). In the research community, the current attention dedicated to gamification management results from the growth and importance of the computer-based game industry, which has led researchers and practitioners to devote attention to developing theories for and an understanding of what makes games engaging (Robson et al., 2014). Subsequently, authors have considered the potential benefits that these theories can bring to achieve business objectives, such as engaging customers and providing a compelling experience (Werbach and Hunter, 2012; Zichermann and Linder, 2013). Therefore, gamification has found applications in multiple domains, such as e-commerce (Insley and Nunan, 2014), innovation (Fuller, 2006; Füller et al., 2011b) and intra-organizational management (Farzan and Brusilovsky, 2011). Moreover, some authors have underscored the interest of using gamification practices in marketing by highlighting their positive effects on the online retail experience (Hamari, 2013).

Gamification is defined in two different manners, from the perspective of game designers or users. The systemic perspective defines gamification as “the introduction of game mechanics and elements (rather than full-fledged games) to design non-game contexts” (Deterding et al., 2011). These practices aim at sustainably inducing customers’ behaviors in favor of the companies’ activities (Werbach and Hunter, 2012; Zichermann and Linder, 2013). This definition distinguishes gamification from closed concepts such as serious games (Abt, 1987) or in-game advertising (Yang et al., 2006), in which elements and mechanics related to the non-entertaining process – learning or advertising – are used...
Within full-fledged games. Similar to this approach, Werbach and Hunter (2012) described gamification as making activities more game-like. More recently, the user perspective has defined gamification as “a process of enhancing a service with affordances for gameful experience to support users’ overall value creation” (Huotari and Hamari, 2012). This users’ perspective highlights the experience that gamification is attempting to provide and notes that a gameful design is not always obtained by concrete elements but rather results from the experience that is lived by users (Insley and Nunan, 2014). Regarding these approaches, gamification may be considered through a game designer’s perspective as game mechanics introduced in a non-game context to influence users’ behaviors and through the users’ perspective as an experiential dimension lived by individuals.

Previous authors have highlighted the positive effects of gamification on attitude (Domínguez et al., 2013), lived experience (Robson et al., 2014), and enjoyment and engagement toward the gamified activities (Witt et al., 2011; Harwood and Garry, 2015). However, although gamification practices can be considered as a lever for companies to guide consumers’ actions and emotions, Lucassen and Jansen (2014) and Werbach and Hunter (2012) both emphasize the need for practitioners to properly understand and manage the gamification mechanics and to not apply these practices for themselves.

To understand gamification practices, Robson et al. (2015) suggested the Mechanics Dynamics Emotions framework (MDE), which was adapted from the game design literature (Hunicke et al., 2004). The authors identified three components of gamification practices – mechanics, dynamics and emotions. The mechanics include the goals, rules, setting, types of interactions and boundary of the situation to be gamified. These elements depend exclusively on designers’ decisions and do not change from one user to another or across time (Robson et al., 2015). Dynamics are behaviors and interactions that emerge from customers’ gamified experience (Camerer, 2003). They encompass both desired behaviors (e.g., cooperation among users or better contributions) and unintended behaviors (e.g., cheating) (Elverdam and Aarseth, 2007). Finally, the emotional components include the positive and negative affective reactions induced by the gameplay (Robson et al., 2015). Therefore, the MDE encompasses both game designers’ and users’ perspectives because it includes the game design imposed by the company’s designers and the users’ reactions.

Adopting the MDE framework, Harwood and Garry (2015) have recently highlighted the impact of gamification mechanics on emotional and behavioral engagement and have noted relational outcomes such as trust and commitment, but they did not consider the cognitive outcomes generated. Furthermore, the authors considered the users to be a homogeneous group reacting similarly to the gamification mechanics. Several studies from the literature regarding game design (Bartle, 1996; Bateman, 2009), online community marketing (Kozinets et al., 2008; Kozinets, 2010) and innovation (Von Hippel, 1986; Bullinger et al., 2010a; Hoyer et al., 2010) have emphasized the existence of multiple user profiles. Therefore, we need to investigate these profiles and assess how they interact and engage within a gamified value co-creation platform. Finally, because CE is a dynamic and iterative process, we need to capture its evolution over time for each user profile.
3. Research context

To identify user profiles and assess the intensity and level of users’ engagement, an in-depth case study method was used. An extensive analysis of a co-creation platform was conducted. Launched in 2013, this platform is becoming increasingly popular in France and has resulted in six inventions being listed for sale during the first year of activity. On this platform, individuals are invited to not only submit their ideas but also vote for and enrich ideas suggested by others. The platform enables users to jointly develop their innovations at every stage, from idea generation to product launch. As depicted in Figure 1, process, idea or design submissions are rewarded through competitive dynamics (i.e., only winning users are rewarded for their contributions). Writing reviews of others’ ideas or voting for a project are rewarded through cooperative mechanics (all users are rewarded for their contributions). The rewards consist of a percentage of the profits generated through the sale of the products and services created. Whereas idea submissions and writing reviews result in rewards with a high expected value, naming proposals and votes offer lower rewards. For instance, submission of ideas is rewarded by 25% of the profits generated from the sale of products or services created based on the idea submitted. However, to receive the reward, the idea needs to win a selection contest managed through a competition mechanics. In contrast, when users vote, they unconditionally share with the other voters 5% of the profits generated through the sale of products or services created based on the idea they voted for.

As displayed in Figure 2, in addition to a thorough literature review, multiple types of qualitative and quantitative data were gathered. Longitudinal data, including all the contributions, submissions, votes or comments made by all platform members over a period of six months, were extracted. We then performed our analysis following two steps. First, we identified user clusters according to users’ behaviors and qualified the profiles. Then, we assessed the intensity of the cognitive, emotional and behavioral engagement for the various profiles and studied their evolution over time. Finally, we triangulated our findings with multiple theories from psycho-sociology, game studies and marketing. In the following sections, we describe each step, including the research design used and the findings derived from the analysis.
4. Step 1: Identification of users’ profiles

4.1. Methods

Cluster analysis. Our initial dataset included 455 individuals’ behaviors covering six months of activity on the platform. Because the users were not registered at the same time on the co-creation platform, we created a dataset that standardized observations in terms of the first month of activity. This dataset includes 234 users for which we had captured the first month of activity. This allows the evolution of users’ behaviors on the platform to be
analyzed based on their entries. In this manner, we obtained monthly data, including five variables characterizing users’ contribution to the co-creation platform. First, the number of submitted ideas refers to the invention suggested by users. These inventions take the form of innovative device drawings, pictures of prototypes or in-depth descriptions of potential projects. Second, the submitted designs reflect the number of times a user suggests particular designs for ideas proposed by other contributors. This includes schemes of future products, colors and device shapes. Third, users are invited to propose names and advertising slogans that could be used to sell the inventions. Fourth, users are encouraged to vote for ideas submitted by others. These votes take the form of a like button on each project. The number of likes influences the decision of experts to select specific projects for further development. Finally, users may comment on projects submitted by others. These comments result in project improvements, debates about the relevance of the submitted inventions and interactions among users. A first exploration of these data revealed that the preceding three months included in our dataset exhibited an insignificant activity level. Therefore, we focused our analysis on the first three months of user activity on the co-creation platform. Consequently, our dataset consists of five variables that describe users’ monthly behaviors on the co-creation platform in their first, second and third month of activity.

According to Dejean and Jullien (2014), the first contributions on an online platform are a good predictor of subsequent behaviors. Therefore, to identify users’ profiles, we performed a cluster analysis based on the five variables characterizing users’ behaviors during their first month of activity. Cluster analysis is a purely empirical method of classification that uses an inductive technique. This statistical procedure consists of dividing respondents into groups that exhibit similarities (in our case, similarities in terms of behaviors). To distinguish the groups, we applied hierarchical cluster analysis. Because this method does not require a priori specification of the number of clusters that should be created, it enables us to identify the multiple groups as they emerge from the data. Within this approach, we adopted Ward’s method, a widely used measure of similarity (Hair et al., 2006).

Netnography and in-depth interviews. The groups emerging from the cluster analysis provided the basis to properly identify the profiles interacting on the co-creation platform.

Thanks to the collaboration we developed with the cocreation platform managers, we followed each contributor’s activities, through their login, and conducted netnography to qualify these profiles. Introduced in the late 1990s, netnography is a qualitative research method that adopts ethnographic research techniques to analyze online interactions (Kozinets, 1997, 1999). Adopted by a number of researchers investigating consumers’ online discussion and behaviors, this method offers the opportunity to gain an understanding of online community functioning (Kohler et al., 2011; Pongsakornrungsilp and Schroeder, 2011; Brodie et al., 2013; Healy and McDonagh, 2013).

As suggested by Kozinets (2010), this work applied a multi-method approach to study the online content by conducting in-depth interviews and analyzing posted comments. First, we observed users’ dialogues and behaviors on the platform. To do so, we followed the
platform activity daily during a 6-month-period and collected 2,174 comments. We then conducted in-depth interviews with nine users. As depicted in Table 1, we selected these users to interview both newcomers who recently registered on the platform and people who had been active for a longer period, i.e., those who had registered on the platform for more than one month and up to one year. The selection also took into account the main activities of interviewees on the co-creation platform. Indeed, the set of respondents includes users who primarily submit ideas and also users who interact with others, vote or simply observe the activity on the platform. The nine interviewed users cover the four emerging clusters and include newcomers and users registered for months. These interviews focused on the meanings users ascribe to their experiences within the co-creation platform and provided internal validity to our work through data triangulation (Coffey and Atkinson, 1996). An interview guide was prepared to provide directions for the semi-structured interviews. Each of these interviews lasted an average of one hour. All interviews were audio-recorded and transcribed into 35,787 words. The data collection, netnography and in-depth interviews continued until theoretical saturation was reached (Glaser and Strauss, 2009), i.e., no new materials emerged through continued investigation.

We coded and categorized all comments and the interviews. We analyzed qualitative materials with open coding to identify the different types of responses or themes that appeared (Miles and Huberman, 1994). We then engaged in a process of axial coding to identify common patterns and connections among codes (Bryman and Bell, 2015). Through discussions among the authors, we reached consensus and also ensured that each factor or theme appeared in the data repeatedly to achieve concept saturation (Glaser and Strauss, 2009). After successive readings and discussions among the authors, the researchers agreed on the codes used and their interpretations.

<table>
<thead>
<tr>
<th>Interviewee</th>
<th>Registered for</th>
<th>Age (years old)</th>
<th>Main activity on the platform</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interview 1</td>
<td>1 month</td>
<td>25</td>
<td>Submit ideas</td>
</tr>
<tr>
<td>Interview 2</td>
<td>1 month</td>
<td>47</td>
<td>Interact and submit ideas</td>
</tr>
<tr>
<td>Interview 3</td>
<td>2 months</td>
<td>28</td>
<td>Interact and submit ideas</td>
</tr>
<tr>
<td>Interview 4</td>
<td>2 months</td>
<td>27</td>
<td>Interact and submit ideas</td>
</tr>
<tr>
<td>Interview 5</td>
<td>8 months</td>
<td>29</td>
<td>Submit ideas</td>
</tr>
<tr>
<td>Interview 6</td>
<td>10 months</td>
<td>50</td>
<td>Interact and submit ideas</td>
</tr>
<tr>
<td>Interview 7</td>
<td>10 months</td>
<td>31</td>
<td>Submit ideas</td>
</tr>
<tr>
<td>Interview 8</td>
<td>11 months</td>
<td>32</td>
<td>Vote and interactions</td>
</tr>
</tbody>
</table>
4.2. Findings

Among the multiple clustering alternatives available, we chose the solution of four clusters because it provided the minimum number of clusters that satisfied the cubic cluster criterion (>2) and $R^2$ (>0.5). Table 2 summarizes each cluster’s information. The first cluster includes 164 members who exhibited few activities on the co-creation platform. This large number of inactive users is consistent with the previous literature regarding online community functioning, which highlights that only a small part of a community acts and/or interacts on co-creation platforms (Kozinets, 2010). The second cluster gathers 37 members whose activities consist mainly of idea and design submissions (1.19 ideas/month and 0.24 designs/month). The third cluster encompasses 13 users whose activities consist mainly of voting for submitted ideas (50.61 votes/month) and suggesting names and slogans for submitted ideas (6.15 names/month). The fourth group includes 20 members who make a significant number of comments (5.1 comments/month) and submit a large number of ideas (0.3 ideas/month).

Table 2: Cluster analysis results - Average contribution per month

<table>
<thead>
<tr>
<th>Cluster</th>
<th># members</th>
<th>#ideas</th>
<th>#comments</th>
<th>#votes</th>
<th>#designs</th>
<th>#names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Invisible user</td>
<td>164</td>
<td>0</td>
<td>0.57</td>
<td>2.59</td>
<td>0</td>
<td>0.23</td>
</tr>
<tr>
<td>Competitor</td>
<td>37</td>
<td>1.19</td>
<td>0.3</td>
<td>1.4</td>
<td>0.24</td>
<td>0.32</td>
</tr>
<tr>
<td>Cooperator</td>
<td>13</td>
<td>0.15</td>
<td>0.08</td>
<td>50.61</td>
<td>0</td>
<td>6.15</td>
</tr>
<tr>
<td>Cooperator</td>
<td>20</td>
<td>0.3</td>
<td>5.1</td>
<td>6.25</td>
<td>0</td>
<td>1</td>
</tr>
</tbody>
</table>

In addition to the cluster analysis, the netnography approach helps qualify the four emerging profiles. Indeed, netnography is an effective tool for examining the behavioral patterns of online user groups [53], which is our aim because we intend to understand the behavior of the four emerging profiles, each of which represents a subgroup of the co-creation platform users. The content analysis of the comments and the in-depth interviews converged to 11 emerging codes related to the profiles’ qualification and the elements they value on the co-creation platform. The codes presented in Table 3 have been classified into three categories: gamification mechanics, users’ motives and the elements users consider valuable in the co-creation platform. Based on the qualitative and quantitative methods used, we provided additional details regarding the four user profiles identified through the cluster analysis.
Table 3: Content analysis results

<table>
<thead>
<tr>
<th>Categories</th>
<th>Codes</th>
<th># time this code appears in the Netnography interviews</th>
<th># time this code appears in the interviews</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Gamification mechanics</strong></td>
<td>Competition</td>
<td>9</td>
<td>7</td>
</tr>
<tr>
<td></td>
<td>Cooperation</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Win state</td>
<td>14</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>Commercialization</td>
<td>7</td>
<td>12</td>
</tr>
<tr>
<td></td>
<td>Community</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Collaboration</td>
<td>27</td>
<td>13</td>
</tr>
<tr>
<td></td>
<td>Discover</td>
<td>4</td>
<td>10</td>
</tr>
<tr>
<td><strong>Users’ motives</strong></td>
<td>Duration of participation</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td></td>
<td>Users’ skills</td>
<td>2</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Platform global objective</td>
<td>29</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Ideas quality</td>
<td>0</td>
<td>7</td>
</tr>
<tr>
<td><strong>Purposes users value</strong></td>
<td>Cognitive (idea emulation)</td>
<td>13</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Behavioral (establish ideas)</td>
<td>19</td>
<td>7</td>
</tr>
<tr>
<td><strong>Positive user engagement</strong></td>
<td>Behavioral (attract people)</td>
<td>33</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Behavioral (further contributions)</td>
<td>30</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>Emotional (excitement-happiness)</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>Cognitive (rejection of submitted ideas)</td>
<td>105</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>Negative user engagement</td>
<td>Behavioral (sabotage)</td>
<td>42</td>
</tr>
<tr>
<td></td>
<td>Behavioral (disengagement)</td>
<td>6</td>
<td>8</td>
</tr>
<tr>
<td></td>
<td>Emotional (anger and deception toward competition mechanics)</td>
<td>27</td>
<td>3</td>
</tr>
</tbody>
</table>

The first group represents a large portion of the platform members (n=164) but exhibits only a lower level of activity regardless of the nature of the contribution. Described by Robson et al. (2014) as spectators, these are users who observe the interactions on the platform without being part of it. However, their engagement is real, even if it is not visible
from their behaviors (Brodie et al., 2013). Indeed, they navigate on the platform, sometimes
daily, and follow the debates and novelties. In this manner, they interact with the platform
even if their contributions are not as visible as those of other users. Therefore, we refer to
these users as invisible users. As illustrated by the following extract from one of the
interviews, invisible users are motivated by the curiosity that they satisfied by exploring,
following debates and discovering others’ submissions and projects.

“I like to go on the website and discover the submitted ideas. I think they are great!
I do it every day. It is impressive to see the number of ideas that are submitted.
Ideas come from all sides.” Interview 4

The second group of behaviors mainly consists of activities that are highly rewarded by
competition mechanics, such as idea or design submissions. We call the users who
predominantly exhibit such behaviors competitors. They want to be recognized for their
skills, such as their ability to generate creative and profitable ideas. They reject the
community mindset which they see as cronyism. Indeed, they think that this sense of
community could lead to privileged relationships or friendship among community
members, which risks becoming a source of bias when members evaluate and judge others’
projects. Competitors register on the co-creation platform to commercialize their already
well-designed projects. They refine their concepts until they are convinced that they are
sufficiently elaborated to win the competition and be selected by experts for further
development. The following interviewee’s statement illustrates this observation:

“I have been working on this project for roughly 5 years. I wanted to apply for a
patent. However, as I do not have enough financial resources to make my project
come true, I am seeking out this platform for that reason” Comment #283

The third cluster mainly submits names and votes. These slightly rewarded activities are
managed by competition and cooperation mechanics, respectively. Therefore, individuals
included in this cluster act independently of the gamification mechanics applied. Rather,
they value the final objective of the co-creation platform and aim to sustain and develop
the related community. These users consider this community as having a transcendent role
in society, such as promoting the economy or creating future innovations. They register on
the platform to be part of a community and collaborate on common projects. Because these
users perceive themselves as members of the community and mainly act to further improve
others’ projects, we refer to them as cooperators. In contrast with competitors, they
legitimize users who have been registered for a long time on the platform. The following
comment illustrates the motivation underlying cooperators’ behaviors on the platform:

“We are registered to this platform to work together and enhance things”
Comment #1601

Finally, the last group gathers 20 members. However, these members are the most active
users on the co-creation platform because they not only submit ideas but also comment on
and review others’ projects. Driven by cooperation and competition mechanics, they use
the cooperation mechanics to create social bonds with other users. For them, this behavior
is a type of strategy that aims to stimulate participation in their own projects and allows a sufficient level of quality to be reached to compete with other users. We describe these users as coopetitors. They both value long-term engagement on the co-creation platform and recognize the importance of users’ skills. Previous literature characterizes coopetitors as a hybrid profile between competitors and cooperators (Brandenburger and Nalebuff, 2011). Nevertheless, the following interviewee’s statement illustrates that coopetitors remain a distinct profile that perceives the complementarity between competition and cooperation mechanics as necessary for the co-creation platform.

“I’m disappointed that members have difficulties understanding that submitting an idea on this platform is a matter of competition between members. It is a competition enabling the community to develop the best product to succeed on the market.” Interview #1

By applying competition and cooperation mechanics with different levels of rewards, the co-creation platform attracts multiple profiles that behave according to different motives. Competitors are driven by competition mechanics and are highly rewarded. Coopetitors use both mechanics as long as they are both highly rewarded and enable them to develop their own project. Cooperators are driven by neither cooperation nor competition mechanics; rather, they value the platform’s final objective and the opportunity to build a community mindset around their interests. Although these profiles interact on the co-creation platform, their expectations and behaviors differ. Therefore, conflicts emerge from their interactions, which impacts their engagement. Because we are seeking to assess the level and intensity of user engagement and capture its evolution, we need to adopt a longitudinal perspective and examine how the engagement of the identified profiles evolves over time. The second step of this study addresses this purpose.

5. Step 2: Users’ engagement on the co-creation platform

5.1. Methods

Regression analysis. Multiple regression analyses were applied to predict users’ first, second and third months of behavioral engagement based on their profiles. Therefore, we used the Customer Engagement Value (CEV) metrics suggested by Kumar et al. (2010) to capture Customer Lifetime Value (CLV), Customer Knowledge Value (CKV), Customer Influence Value (CIV) and Customer Referral Value (CRV).

CLV represents the future profitability of the customer over his/her entire lifetime with the co-creation platform. CRV is defined as the extent to which customers can engage other customers toward the platform. CIV refers to the influence an individual exerts on other customers’ or prospects’ behaviors. It indicates the strength of ties customers generate in a group, network or community. Finally, CKV includes the feedback and knowledge customers provide to the community regarding innovation and improvement of existing products or services. For each of these dimensions, we used proxy variables. CLV was evaluated through the duration of members’ activity on the platform. CRV was measured through the number of reviews submitted to the platform. CIV was assessed through the
number of votes posted. Finally, CKV was evaluated using a score that reflects the number of ideas, names and designs submitted. For the analyses, the four CEV scores were calculated for the first, second and third month of users’ activity. For each month, four regressions were applied using the CEV metrics (CKV, CIV, CRV and CLV) as the dependent variables. We thus obtained 12 regressions. The independent variables were developed based on the clusters’ membership. Cluster dummy codes were constructed, and people who exhibited no activity were not categorized in a cluster but rather were used as the referent category in regression models (Kumar et al., 2010).

Netnography and in-depth interviews. In addition to using qualitative methods to qualify emerging clusters, we investigated users’ emotional, cognitive and behavioral engagement adopting the same approach. Netnography and in-depth interviews provide understanding regarding users’ behavioral engagement highlighted by the results from the multiple regression analysis and provide insights on users’ emotional and cognitive engagement according to the profiles. However, to lend nuance to our findings, we distinguished the positive and negative outcomes resulting from users’ engagement. As indicated in Table 3, netnography and in-depth interviews converged to result in nine emerging codes that reveal both positive and negative outcomes derived from users’ emotional, cognitive and behavioral engagement with a gamified co-creation platform.

5.2. Results

Behavioral engagement outcomes. The multiple regression analysis highlights an important difference in the levels of the CEV dimensions - CLV, CKV, CRV and CIV- among the four user profiles. Furthermore, the evolution of users’ level of engagement also varied across time. The results of the multiple regressions capturing the longitudinal perspective of users’ engagement are summarized in Table 4. The results yielded by this quantitative analysis are enriched by the insights derived from the content analysis.

Table 4: Regression analysis results - Estimated coefficients (p-value)

<table>
<thead>
<tr>
<th></th>
<th>1st month</th>
<th>2nd month</th>
<th>3rd month</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>&lt;.0001</td>
<td>1</td>
<td>.353</td>
</tr>
<tr>
<td>Invisible</td>
<td>0.282</td>
<td>0.918</td>
<td>1.333</td>
</tr>
<tr>
<td>Competitor</td>
<td>0.389</td>
<td>0.354</td>
<td>0.307</td>
</tr>
<tr>
<td>Cooperator</td>
<td>0.803</td>
<td>0.083</td>
<td>53.91</td>
</tr>
<tr>
<td>Coopetitor</td>
<td>1.032</td>
<td>5.375</td>
<td>6.518</td>
</tr>
</tbody>
</table>

|         | 25.44 | 0.682 | 0.271 | 9.032 | 0.712 | 0.117 | 1.905 |
| Invisible | .664 | .0354 | .0465 | .983 | .567 | .646 | .943 |
| Competitor | .004 | .025 | .893 | <.0001 | .125 | .873 | .003 | .047 | .838 | .048 |
| Cooperator | <.0001 | .728 | <.0001 | <.0001 | .595 | <.0001 | .357 | .017 | <.0001 | .0007 |
| Coopetitor | 1.032 | 5.375 | 6.518 | 7.291 | 3.69 | 3.568 | 6.75 | 2.595 | 1.45 | 4.345 |
|         | .032 | .019 | <.0001 | .116 | .098 | <.0001 | .058 | .0008 |
First, CLV refers to the activity duration. As indicated by Figure 3, even if there is an intense decrease of activity during the first months for all users, the cooperators and coopetitors exhibit longer activity on the co-creation platform (1.8 and 2 months, respectively) than competitors and invisible users (1.4 and 1.3 months, respectively). As expressed by the following comments, the cooperators and coopetitors legitimize users when they are registered for a long time:

“I invite you, if you have time and because I see that you have been registered for only one week and consequently have not followed what happened during the past year, to go and see the ideas that have been preselected, the number of votes, and the comments. When you have performed it, go and see commenters’ names and then record their data, their contributions and their great constructive comments. When you have performed that, see when they were connected for the last time and you will understand that comments coming from BJ, Arnaud and myself are based on their knowledge of the platform resulting from long-term participation.” Comment #2

“I think the users’ integration in the community and its functioning requires time.” Comment #379

In contrast, competitors’ participation depends on the extent to which they perceive themselves as able to win the competition. If the community rejects their ideas, then they consider the likelihood of commercializing their projects as decreasing; after a while, they start doubting the platform’s functioning and tend to disengage from it. For example, one of the interviewees described his feelings after having received negative feedback from the community:
I connected myself when I posted ideas. I was regularly connected to see what users’ mindset was. Then, I never visited the platform because I think that there is no chance for one of my projects to be selected, produced and sold. Interview #1

Second, Figure 4 shows that competitors exhibit a higher level of CKV during the first month of activity, but it quickly decreases during the second month. In contrast, cooperators and coopetitors reveal a lower level of CKV during the first month, but this level remains significant until the third month. Therefore, whereas competitors seem to be valuable short-term partners, cooperators and coopetitors exhibit more moderated behavioral engagement intensity, and their engagement persists over a longer term. Competitors’ willingness to post ideas strongly depends on the initial feedback they receive from the community. Indeed, one of the interviewed competitors explained why he no longer wanted to post ideas:

“When I posted my first ideas I found it cool to submit my project. Then, I received comments that were not really pleasant. So I was a bit disappointed. I paid 30 euros to have the opportunity to submit my project, and I received only negative feedback and unpleasant comments. Therefore, I do not really want to post new ideas and go on the platform.” Interview #1

From the first to the third month, Figure 5 reveals that the cooperators present significantly higher CIV than any other profiles. Furthermore, their CIV score constantly increases during the three studied periods. Indeed, over time, cooperators feel increasingly integrated in the community and therefore consider the need for them to influence the co-creation process occurring on the platform by promoting or not submitting projects. Regarding the competitors, while they do not directly try to influence the selection process, they
demonstrate sometimes opportunistic behaviors such as creating fake accounts or involving friends and relatives on the platform to promote their ideas or sabotage others’ projects. These behaviors are severely condemned by cooperators and coopetitors. For example,

“I have noticed something and I would like to have your opinion. I think that some users on the website have two accounts, one to submit their ideas and another one to vote for whatever they want. But, that’s only my opinion because, like you, I still have not retrieved my 10 votes” Comment #741

“If you have removed some votes, please put them back. You have to know that it’s not useful to scuttle others’ ideas. First, it biases the results. Then, it does not help the platform’s experts. Finally, it gets on members’ nerves who receive negative votes without any explanations” Comment #317

Finally, as displayed in Figure 6, the coopetitors exhibit a higher level of CRV during the three months because they are the users who have the highest number of interactions with the other users on the platform. Because the coopetitors highly value the interactions regarding their projects, their participation depends on the presence of feedback on their submitted ideas. This is illustrated, for example, by a user’s comment blaming the community for not receiving any positive or negative feedback on his project: Some ideas do not receive any comments or feedback for one month. Is this your definition of a community? I think that people here seek feedback, criticism and direction to position and develop their ideas. Comment #2100
Emotional engagement outcomes. In terms of emotional engagement, cooperators and coopetitors reveal anger and irritation toward competition mechanics when they are misused by competitors. They consider these practices harmful for the community’s objective because they promote opportunistic behaviors and bias the ideas selection process. The following extract regarding a form of competition mechanics, the vote system operated on the platform, illustrates this statement:

“It is useless to sabotage other projects. On the one hand, it biases the competition for the idea selections. On the other hand, it tends to get on members’ nerves who suffer from negative votes and feedback without valuable comments.” Comment #351

Positive and negative feedback also have an influence on the emotional engagement experienced by users. Although users feel excitement and happiness when they succeed, coopetitors and competitors react differently when they receive negative feedback and results. Indeed, competitors receiving negative feedback express doubt about the functioning of the platform and the users’ competences and understanding. The following reaction of a competitor whose ideas were rejected illustrates this statement:

“My worst memory of my participation on the platform is the unpleasant comments I received regarding the ideas I had submitted. That disappointed and demotivated me to submit again. It is quite surprising because I bought the opportunity to submit ideas. I paid 30 euros and then I received this unpleasant feedback. Therefore, I do not want to submit anything anymore.” Interview #1
In contrast, coopetitors consider negative feedback as a source of learning; consequently, they want to submit further projects, but they refine their practices. For example, there is the reaction from a user whose ideas were rejected by the community because the product was already available and thus not innovative:

_I’m really happy that it exists. I have mine (easy and cheaper!). I have used it every day for years and it works. I will come back with another idea! I “invent” or rather “put together” firstly for fun and the sake of enjoyment. I’m really happy to have found this community. So I will try further._ Comment #1850

However, coopetitors exhibit disappointment when they are negatively judged by peers without receiving comments or appropriate feedback. Indeed, they consider the judgment to be either from people who do not have the skills to evaluate their work because they are not able to contribute or from competitors who tend to sabotage others’ projects for their own benefit in the competition. The following comment illustrates coopetitors’ disappointment in receiving negative votes without feedback:

_“I would like to thank the contributors giving their impression about my idea. They can be pro or against. Since I am registered on this platform my objective is to share with the community. However, a vote “against” without any justification is really disappointing as it does not provide the opportunity to generate a debate and thus to improve the project. That is what makes people grow up.”_ Comment #51

Cognitive engagement outcomes. Coopetitors and cooperators frequently reveal the emulation they feel, sometimes uncontrolled, when they interact on the co-creation platform not only for their own but also for others’ projects. This emulation leads them to further contribute to the submitted projects by bringing ideas, associating projects or creating additional and advanced methods of presenting the project (e.g., videos and design schematics). The following comment reflects idea emulation occurring:

_“That’s me again! When ideas jostle in my mind, I can’t stop it.”_ Comment #6

Cooperators value the development of the co-creation platform and the related community. Therefore, the quality of the submitted ideas is considered a key element for the proper development of the platform. To ensure the quality of the process, cooperators not only contribute to others’ projects but also assess the submitted ideas and influence the selection process. This willingness to assess the relevance of the submitted projects leads them sometimes to conduct further investigations. This practice is often strongly rejected by competitors, who feel their legitimacy is doubted, as depicted by the following dialogue between a cooperator and a competitor just after the former demonstrates that the submitted ideas already exist in multiple forms:
Competitor: “Sorry, but I really do not understand your approach. If you have time to lose with investigations, go ahead, but honestly I do not see your point.” Comment #1515

Cooperator: “As I am used to doing when people do not know me, I will justify my approach! If there would not be any interest in looking if similar products or patents already exist, why do the platform managers ask that such research be performed BEFORE posting ideas? Indeed, it is not sufficient to have a great idea, you also need to be able to assess the innovative characteristic, the potential market size and the existing competition.” Comment #1516

6. Discussion

This study investigates gamification mechanics as a means of creating, boosting and maintaining users’ engagement with a co-creation platform. Using multiple complementary methodologies, namely cluster analysis, netnography and multiple regression analysis, these exploratory research findings provide strong evidence to support the existence of four user profiles interacting on the co-creation platform. These profiles reveal particular motives, behaviors and reactions toward gamification mechanics. This study assesses users’ level of behavioral, emotional and cognitive engagement and captures the dynamic nature of this engagement by adopting a longitudinal perspective. The four emerging profiles that we identified are supported by agency and communion theory used to characterize individuals’ interpersonal interactions (Bakan, 1966). Individuals who exhibit an agent orientation tend to emphasize their mastery and dominance of their environment, whereas communion-oriented people interact to ensure the harmony and development of their environment (Locke and Nekich, 2000; Trapnell and Paulhus, 2012). Therefore, while the previous literature distinguishes cooperation and competition as two extremes of one dimension, the communion and agency literature considers them as distinct dimensions. We classified competitors as dominant and unfriendly (A+/C-). These users tend to dominate the platform by submitting well-designed ideas and succeeding in commercializing their projects. Cooperators emphasize submissive and friendly behaviors (A-/C+). They aim to sustain and develop the platform. They serve the community. Coopetitors exhibit leadership on the platform as they interact well with other users to develop their own projects (A+/C+). Finally, invisible users do not take part in the community or perform actions on the platform (A-/C-). They are spectators (Robson et al., 2014).

Based on these insights regarding users’ profiles, we examined their behavioral, cognitive and emotional engagement to propose a conceptual model for a gamified co-creation platform. As depicted in Figure 7, according to their profiles, users seem to make different contributions on the co-creation platform and have specific expectations regarding the value they want to obtain from their interactions (Mathwick et al., 2001; Holbrook, 2006; Nambisan and Baron, 2009). The motives emerging from the content analysis are consistent with previous research investigating users’ activities on online co-creation platforms (Nambisan, 2002; Nambisan and Baron, 2007, 2009; Füller et al., 2010; Roberts et al., 2014). However, this study reveals the salience of specific motives according to the users’ profiles. Indeed, competitors seem to be highly concerned by the efficiency aspect
and mainly seek to commercialize their already well-designed ideas; they are driven by extrinsic motives (Roberts et al., 2014). Cooperators seem to be highly involved in the community. They are mainly motivated by being integrated within a community and being recognized as part of it (Nambisan and Baron, 2009; Roberts et al., 2014). The invisible users are driven by their curiosity, and they most value the hedonic dimension of their experience on the platform because they seem to enjoy exploring and discovering others’ projects and debates (Nambisan and Baron, 2009). Regarding coopetitors, they are described by the previous literature as a hybrid profile between cooperators and competitors (Bullinger et al., 2010a). However, the content analysis reveals that coopetitors have specific motives as they seek collaboration on their own projects by interacting with other users (Roberts et al., 2014). In that context, the gamification mechanics are used by users to derive their expected value. Competition mechanics are used by competitors and coopetitors to legitimize their expertise. Cooperation mechanics are used by coopetitors to motivate others to contribute to their own projects. The other user profiles are indifferent to these mechanics, especially the cooperators who reject them because they would risk distracting users from the primary platform objective, i.e., the joint development of innovations.

Similarly to Robson et al. (2015), who adopted the MDE framework, this study demonstrates that, based on the gamified co-creation experience, users’ engagement outcomes can be either emotional or behavioral. Additionally, we emphasize the cognitive engagement outcomes that may be generated through such experiences. In the NPD process, these cognitive manifestations of engagement take, for example, the form of idea emulation or rich user reviews of submitted ideas. These three forms of user engagement outcomes – cognitive, emotional and behavioral – are supported by Brodie et al. (2011). According to the content analysis, CE may generate positive or negative effects on the general functioning of a co-creation platform (Werbach and Hunter, 2012). Indeed, because the multiple profiles have different motives and contributions, their interactions reveal potential conflicting interests (Baron and Warnaby, 2011). For example, competitors who are characterized by short-term participation are often criticized and do not receive sufficient legitimacy from cooperators and coopetitors, who value long-term participation. Therefore, competitors tend to disengage from the co-creation platform after some time as they see the interest in their ideas and projects decreasing. The lack of interest in competitors’ projects comes from the cooperators’ and coopetitors’ underestimation of competitors’ contributions because they consider competitors to be newcomers. (Greer, 2015). Finally, as suggested by Brodie et al. (2011), this study captures the iterative and dynamic nature of engagement. Indeed, for the different user profiles, the CE evolves differently. While competitors exhibit short-term engagement, cooperators and coopetitors are long-term partners (Bullinger et al.; 2010).
7. Conclusion

In increasingly complex competitive environments, the opportunity to engage customers in a value co-creation process is a highly challenging task for companies, especially in the online context. This study, which is based on complementary qualitative and quantitative methods, offers a fine-grained understanding of how gamification mechanics might be used to create, boost and maintain users’ engagement toward a co-creation platform. Therefore, this study, which is supported by the communion and agency literature, highlighted four user profiles – cooperators, competitors, coopetitors and invisible users. We then assessed the multiple levels and intensity of emotional, cognitive and behavioral engagement according to the user profiles and captured the dynamic and iterative nature of CE through a longitudinal perspective. Finally, a theoretical model summarizing our findings was proposed to stimulate further empirical studies.
This study bridges marketing and game studies and contributes to both fields. We emphasize gamification as a valuable means of designing smart technologies (e.g., wearable devices, 3D environment, social media, connected technologies, and Kinect technologies) to create, boost and maintain users’ engagement, a widely targeted variable for marketing managers (call from Breidbach et al. (2013); Djelassi and Decoopman (2013); Ostrom et al. (2015)). This study highlights four profiles that react differently to gamification mechanics and provides insight regarding how these profiles co-exist and interact through a smart platform (call from Vernette and Hamdi-Kidar (2013); Angelis et al. (2012); Navarro et al. (2015)). Furthermore, we captured the dynamics and iterative nature of CE, as described in a recent study by Brodie et al. (2011), by highlighting the evolution of CE according to the various profiles. Dejean and Jullien (2014a)’s edsBullinger et al. (2010b). This study also contributes to the game literature because it notes the cognitive dimension of CE in addition to the emotional and behavioral components, which have already been emphasized by the MDE framework (Hunicke et al., 2004; Robson et al., 2015). The cognitive dimension emerges from the content analysis and is supported by the literature related to CE (Brodie et al., 2011; Brodie et al., 2013).

Despite our intensive and multi-method approach, some limitations persist. Because this study is one of the first explorations of gamification mechanics (Hamari et al., 2014; Lucassen and Jansen, 2014), further research should provide generalizability to our findings and investigate other gamification practices, such as badge systems, 3D environments or playful design, and other contexts, such as healthcare, retail or services. The use of an experiential approach and the associated metrics (Mathwick et al., 2001; Füller et al., 2011b) seem to be a valuable alternative. Furthermore, longitudinal investigations should be used to capture the evolution of users’ engagement over time. (Mehrabian and Russell, 1974)

This study provides practitioners with guidelines regarding the relevance of using competition and cooperation mechanics according to the profiles they want to interact with. For example, our study does not support using competition or cooperation mechanics in an online community because these practices are rejected by cooperators, who constitute a large proportion of the members on these platforms. Competition mechanics are more relevant when managers expect an intense but punctual contribution. A combination of cooperation and competition mechanics would be valuable when managers plan to collaborate with coopetitors in a long-term partnership.

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