

Co-Creation of New Solutions through Gamification: A Collaborative Innovation Practice

Abstract

This paper aims to explore the main implications of gamification approaches to collaborative innovation and particularly to co-creation, i.e. the interaction and interchange of ideas between users, customers, suppliers and other actors in the development of new solutions. Despite the few approaches attempting to make co-creation more ludic and accessible, researchers have yet to analyze the link between gamification and co-creation in an extensive manner. In order to better understand this unexplored relationship, empirical case research studies have been conducted with multi-actors participating in a real-life co-creation project through the deployment of a gamified method and tool (ideaChef®), as well as a combination of different instruments, involving speed meetings, workshops, debriefings and interviews. Besides advancing the body of knowledge on collaborative innovation practices and conceptualizing the relationship between gamification and co-creation, this paper provides important implications for managers on how multiple actors can be engaged and coordinated in such practices through gamification. The paper's main contribution lies in the suggestion that engagement goes hand in hand with coordination, and that a combination of both will be the best strategy for co-creating new solutions through gamification.

Introduction

The nature of competitive environments increasingly demands collaborative innovation practices in order to support the interaction and interchange of ideas among multi-actors in a knowledge-building environment, such as the co-creation of new solutions (Baldwin & von Hippel, 2011).

Co-creation is the practice of developing meaningful products, services or systems through a more participative process, with stakeholders engaged in a collective creativity environment. It can be described as the interaction and interchange of ideas between multiple actors, e.g. users/customers, suppliers and other stakeholders in the development of new solutions, such as products, services, processes, organizational designs and business models (Galvagno & Dalli, 2014; Grönroos & Voima, 2013; Ind & Coates, 2013; Prahalad & Ramaswamy, 2004; Sanders & Stappers, 2008).

By drawing attention to the importance and complexity of co-creation, this paper acknowledges that gamification provides more successful support approaches to these kinds of collaborative innovation practices. In fact, gamification is the process of making activities more game-like in non-game contexts, to encourage users' motivation and engagement in a particular task (Deterding, Dixon, Khaled, & Nacke, 2011; Werbach, 2014).

Gamification approaches offer a substantial payback in the co-creation of new solutions by supporting this practice in an open, engaged and collaborative environment (Ind & Coates, 2013). The novelty of gamification in co-creation, in relation to other approaches that already use game elements, is the introduction of structure, coordination and participation elements. Instead of just trying to make co-creation more ludic and accessible, gamification provides the rules and the process that are required to engage teams and create high-quality solutions in an open and creative environment (Ind & Coates, 2013; Sanders, 2000; Sanders, Brandt, & Binder, 2010).

Examining the link between gamification and co-creation offers a better understanding of how co-creation practices can be enhanced. This paper, therefore, bridges the theory-practice gap on gamified co-creation approaches by illustrating how gamification approaches can overcome the lack of structure, coordination and engagement of other gameful approaches and more effectively support collaborative innovation practices.

The link between gamification and co-creation is an original and highly significant topic. First, there is a lack of empirical research in real organizational settings that explores the use and implications of gamification for co-creation. Second, gamification holds the potential to improve the results of collaborative innovation practices by encouraging the involvement and participation of all key actors in the development of new solutions, i.e. products, services, processes and business models. Moreover, it facilitates the coordination of knowledge between different actors and the organization of co-creation, which is particularly relevant in messy and more complex innovation processes.

The purpose of this paper is, thus, to explore these implications, increasing our understanding of this unexplored relationship. The key research question that addresses the theory-practice gap is, “How can gamification approaches support the co-creation of new solutions in a collaborative innovation context?” The aim is to drive exploratory research on how gamification can ensure both the engagement and coordination of multi-actors in the co-creation of new solutions, concepts which further studies can build upon.

Empirical studies were conducted on the real case scenario of a co-creation project involving multi-actors from creative and traditional industries in collaborative innovation practices. In order to achieve a more specific understanding of the link between gamification and co-creation and its implications, a case study which involved the customer, the supplier and a team of designers in the concept co-design of a new line of furniture was carried out with the support of a gamified method and tool (ideaChef®).

This paper provides contributions that advance the scholarly understanding of how gamification enhances co-creation in the context of collaborative innovation approaches. It complements the body of knowledge on collaborative innovation (Agogué, Yström, & Le Masson, 2013; De Silva, Howells, & Meyer, 2018; Ollila & Elmquist, 2011; Ollila & Yström, 2016), co-creation of new solutions (Galvagno & Dalli, 2014; Grönroos & Voima, 2013; Ind & Coates, 2013; Prahalad & Ramaswamy, 2004; Sanders & Stappers,

2008) and gamification of innovation (Roth & Schneckenberger, 2012). Thus, the main contribution to theory is the conceptualization of gamification in co-creation practices, offering a new research stream that is particularly relevant for the concept development phase of innovation at an early stage and contributing to a broader discussion and understanding of the ability to engage, coordinate and support the process of multi-actor knowledge creation.

In terms of consequences for future practice, this paper provides key implications for managers on how to facilitate and enhance the co-creation of concepts for new products, services or business models through gamification. In fact, findings demonstrate that gamification provides a more structured and engaging platform for multi-actor dialogue, mutual understanding, alignment of goals, creative experience sharing and concept development.

Literature Review

Gamification

Gamification is defined as the use of game-based elements in non-game contexts to encourage users' enjoyment and engagement, particularly while performing a demanding and complex task (Deterding et al., 2011; Galetta, 2013; Harwood & Garry, 2015; Piligrimiene, Dovaliene, & Virvilaite, 2015; Robson, Plangger, Kietzmann, McCarthy, & Pitt, 2015).

By providing gamified experiences, such as having fun and gaining a feeling of mastery, organizations are making desired behaviors more engaging even in boring tasks and contexts (Harwood & Garry, 2015; Koivisto & Hamari, 2014; Roth, Schneckenberg, & Tsai, 2015). Yet only a well-designed gamification experience, with the right mix of rewards and emotions, can induce the desired behavioral changes so that employees repeat the behavioral outcome desired by the organization in a habitual or routine form (Robson et al., 2015).

Gamification can be applied to many internal functions of the firm (e.g. to improve employee engagement), or external (e.g. to co-develop products with customers) (Piligrimiene et al., 2015; Robson et al., 2015; Ruhi, 2015). Neither is it restricted to digital approaches such as software for computers and smartphones (Deterding, 2015). The development of successful and meaningful gamification experiences involves both the application of design principles and psychological, social and behavioral theories, ensuring that the experience provided to users is enjoyable and challenging and not just a simple process of applying point systems, reward graphics, colors and animation (Harwood & Garry, 2015; Schoech, Boyas, Black, & Elias-Lambert, 2013; Seaborn & Fels, 2014).

Co-Creation

Fast-changing and evermore competitive business environments are driving collaborative innovation practices forward. This can be explained by the fact that innovation processes are increasingly more dependent on external knowledge sources and higher levels of collaboration among diverse teams (Ollila & Elmquist, 2011). The dynamic and messy nature of collaborative innovation is highly resource-consuming and often painful, making it more challenging to manage multi-actors who are more difficult to engage, coordinate and support in their knowledge creation (Huxham & Vangen, 2004; Ollila & Yström, 2016).

So as to address this difficult scenario and make collaborative innovation work effectively, different forms of managing have been proposed in the literature (Huxham & Vangen, 2004). Most of them are focused on ways of engaging with external partners, such as innovation intermediaries, open innovation communities, innovation networks and open innovation arenas (Ollila & Yström, 2016). Innovation intermediaries (often called third parties, bridgers, agents or brokers) are those who provide a supportive role and handle problems related to collaboration among partners during the various stages of the innovation process (De Silva et al., 2018; Ollila & Yström, 2016). The involvement of intermediaries in collaborative innovation has been highlighted in relation to other forms of managing collaborative innovation. This is because of their ability to connect and coordinate knowledge between multi-actors, going beyond the simple brokering and connecting of activities, as well as playing a new role as co-creators (Agogué et al., 2013).

There is a growing body of literature on co-creation innovation in which users at firms and other relevant stakeholders generate value through interaction in a collective creative environment (Frow, Nenonen, Payne, & Storbacka, 2015; Galvagno & Dalli, 2014; Grönroos & Voima, 2013; Sanders & Stappers, 2008). This perspective is driven by firms that want to cooperate with key suppliers and thereby co-create value, meaning that they are no longer on opposite sides, but rather interacting with each other in pursuit of new solutions (Galvagno & Dalli, 2014; Prahalad & Ramaswamy, 2004). Co-creation of valuable solutions requires enabling users to co-create their own unique experience besides welcoming their inputs towards solution design (Gentile, Spiller, & Noci, 2007; Prahalad & Ramaswamy, 2004).

For their potential to be fulfilled, these types of practices should be managed through the acknowledgement of the following principles of co-creation: i) Stakeholders only participate enthusiastically in co-creation when it produces value for them; ii) Successful co-creation is focused on providing rewarding experiences for customers, employees, suppliers and other stakeholders; iii) Multiple stakeholders should be able to dialogue, i.e. to interact directly with one another; and iv) Stakeholders should be able to use engaging

platforms to interact and share their experiences, besides developing an understanding of the problems and priorities of other key players (Ramaswamy & Gouillart, 2010). Applying these principles helps mitigate the risks of a difficult and resource-consuming process and expands the prospects of having a more positive and productive collaborative environment for the co-creation of new solutions.

Conceptualizing Gamification and Co-Creation

From the design perspective, co-design is the term used to describe co-creation and can be considered a specific case. Co-design refers to any act of collective creativity, within a diverse team of users/customers and suppliers, with the designers' intermediation, where users' expertise plays a key role in knowledge development, idea generation and idea development (Lee, 2008; Sanders & Stappers, 2008).

Co-design takes place in the early stage of innovation, usually characterized by high levels of uncertainty, and encompassing idea generation, idea/concept development and prototype. Thus, users should be provided with a comprehensive set of tools for ideation and expression to ensure close interaction with different stakeholders and provide creative collective experiences. This is particularly important when, as is often the case, it is not known exactly what the deliverable of the co-design process will be (Grönroos & Voima, 2013; Sanders & Stappers, 2008).

Given its nature and capability to engage users in the accomplishment of complex tasks, gamification approaches to innovation hold the potential to deal with other co-design issues, like the coordination and participation of multiple actors. Regardless of how meaningful gamification can be to the co-design of new solutions, only a few studies have explored the relationship between game approaches and co-creation. In fact, current literature from the perspective of participatory design studies describes scenarios where designers and non-designers apply game elements to make co-creation more ludic and accessible, typically supporting visioning, storytelling and prototyping tasks (Ind & Coates, 2013; Sanders, 2000; Sanders et al., 2010).

The reason why the existing theory does not offer a feasible answer to the research question is because the above-mentioned gameful co-creation initiatives and toolkits are excessively focused on ludic and fun approaches. They, therefore, do not provide a structured system with clear procedures that facilitate the engagement and involvement of users with knowledge transfer. Gamification approaches differ from these co-creation initiatives and toolkits that already borrow from game principles by way of the rule system/environment dimension. Gamification approaches to innovation incorporate game elements (dynamics, mechanics and components) and explicit goals, which are used across the phases of discovery, idea generation/evaluation, idea development and the decision to develop new products/services (Patrício, Moreira, & Zurlo, 2018).

Gamification thus has the power to enhance co-creation practices by overcoming the lack of structure, coordination and engagement in other game approaches.

Methodology

Theoretical purpose

In order to clarify the relationship between gamification and co-creation, a key research question is proposed: How does gamification support co-creation, i.e. the participation, interaction and interchange of ideas among multi-actors in the development of new solutions?

Case study research was the method adopted to understand the unexplored relationship between gamification and co-creation collaborative innovation practices. This method is appropriate as it facilitates a more comprehensive understanding of such an emergent phenomenon (Goffin, Ahlström, Bianchi, & Richtner, 2018; Kindström, Kowalkowski, & Sandberg, 2013; Ponelis, 2015; Yin, 2009). Exploratory research on the main implications of gamification approaches to co-creation is needed to close the theory-practice gap regarding the lack of gamification approaches in co-creation collaborative innovation practices (Barratt, Thomas, & Li, 2011; Goffin et al., 2018; Yin, 2009). The case studies were chosen for theoretical reasons and exhibit appropriate data to help better understand this phenomenon (Eisenhardt, 1989; Meredith, 1998; Yin, 2009).

Research method

This research followed a two-step approach. The first characterized the main issues related to participant interactions in co-creation, in which gamification was not involved. The second step then integrated the use of gamification to assess its implications in a concrete co-creation process.

During the first step, it was possible to gather valuable insights on key drivers and constraints of collaborative innovation practices as expressed by firms participating in a real co-creation project. It served as a preliminary study to adjust and improve a case study conducted during the second step that applied a gamification method and tool to a concrete co-creation situation. This subsequent step contributed to achieving the exploratory research aim: to gain a qualitative understanding of the phenomenon's underlying reasons and motivations within a real-life context, which have a clear research purpose (Yin, 2009).

A research sample was taken from a concrete Co-Create project co-financed by the European Regional Development Fund of the European Commission. The goal of this project was to support cross-fertilization processes between creative industries and traditional clusters, thereby contributing to test co-design and creative methods applied to

entrepreneurs and cluster managers. The Co-Create project aimed to promote the cooperation between new methodologies and tools addressed to SMEs and policymakers.

Therefore, cases from the Co-Create project were selected for this exploratory research study because of the good match between the goals of firms involved in this project and the promotion of collaborative innovation practices of co-creation. The Co-Create project offered a good opportunity to conduct research and thereby access valuable data and significant theoretical insights. Research data from these cases was thus particularly suitable for enlightening the relationship between gamification and co-creation (Eisenhardt & Graebner, 2007). For all these reasons, the Co-Create project provided an appropriate scenario for exploring and understanding how gamification can be used to support the co-creation of new solutions.

Data collection

Empirical research studies have been conducted through a combination of different instruments, i.e. speed date meetings, background information on the Co-Create project (e.g. initial motivation of participants and previous initiatives), gamification workshop observations and debriefing, as well as in-depth interviews to address the research objective. Multi-actors from the Co-Create project representing customers and suppliers comprised the unit of analysis in the two research studies.

In order to support the first step of the research method, a study was set up during one of the Co-Create project activities, called speed date meetings, in which business-to-business meetings were held to connect firms from traditional sectors (customers) and creative sectors (suppliers) in the search for opportunities to co-create new solutions. A sample of two firms from creative sectors and two others from traditional sectors, participating in these speed date meetings (see table 1), were chosen based on the likelihood of receiving richer insights. The purpose was to gather more balanced and deeper insights on the drivers and constraints of new co-creation solutions in the Co-Create project.

Table 1. First Step - Speed Date Meetings: characterization of the sample

Participant	Role of the Participant(s)	Perspective	Type of firms
#1	Administration Manager	Supplier	Creative (Merchandising)
#2	Head of Design and Head of Marketing	Supplier	Creative (Product design)
#3	Marketing Manager	Customer	Traditional (Furniture accessories)
#4	Head of HR/Finance and Sales & Marketing	Customer	Traditional (Metalworks)

After the speed date meetings session, individual interviews were conducted with the four participants, i.e. the firm's representatives, following a semi-structured procedure.

This included a number of questions, which focused on the participant’s experience (see appendix 1). The goal was not to influence participants but allow them to spontaneously express their own experiences, inner thoughts and expectations concerning this kickoff phase of co-creation practices.

Aiming to understand the role of gamification in the interaction and interchange of ideas among multi-actors in the concept development of new solutions (the second step of the research method), a new study was conducted. The study was based on the concrete case of an opportunity identified during the previous speed date meetings session, involving a diverse team (composed of users/customers, suppliers and designers) in the co-design of a new line of furniture (see table 2). This case was selected because of the research potential it offered to explore the deployment of gamification.

ideaChef® was the gamified method and tool applied during a workshop session to enable the co-design of a new furniture line concept. Workshop participants included representatives from a flooring manufacturing firm (the customer of this new concept), a creative studio (potential supplier) and designers (external party, intermediating and providing inputs for the concept design). During the gamification workshop, the team further developed the initial concept proposed by the creative firm to the flooring manufacturer. This concept addressed a brief that was prepared and submitted by the flooring manufacturer during the first session of the Co-Create project.

Table 2. Second Step - Gamification Workshop Session: characterization of the sample

Participant	Role of the Participant	Perspective	Type of firms
#1	Area Manager	Customer	Traditional (Floor Manufacturing)
#2	Head of Design	Supplier	Creative (Product Design Studio)
#3	Designer	Designer	University
#4	Designer	Designer	

Immediately after the workshop session, a debriefing interview was conducted with all participants in order to quickly discuss their experiences and results (see appendix 2). Following this, in-depth interviews with each of the participants were conducted the week after the workshop session, exploring in more detail their behaviors, concerns, motivations and expectations, as well as the implications of the gamification approach to co-creation (see appendix 3).

The two-stage interview process provided great robustness to the data collected. Moreover, research questions were not addressed directly during the interviews in order to avoid leading questions, which might have tempted interviewees to confirm the study design so as to please the researchers or to look good in the study (Zomerdijk & Voss, 2009). First, the data collection process followed a clear procedure in which data was collected from multiple sources, i.e. interviews, speed dating meetings and workshop

observations, complemented by the Co-Create project internal documents, which allowed triangulation (Eisenhardt, 1989; Yin, 2009). Second, the origin of the data gathered, in addition to debriefing and the in-depth interview questions provided, made it possible to replicate data collection. Finally, data was reviewed and validated by one of the fellow researchers who had not participated in the data collection (Goffin et al., 2018).

Gamified approach

ideaChef® was the gamified method and tool chosen to support the co-creation workshop session. ideaChef® was chosen because it enables diverse teams to convert high potential ideas into working concepts or prototypes. It serves to create solutions that address a particular challenge, need or problem, related to either internal processes or to the external market, based on an existing idea. It supports convergent thinking by helping to narrow a number of potential solutions down to a “best fit”, which provides an engaging and more efficient way of selecting and developing ideas to be prototyped or implemented (Patricio, 2017).

ideaChef® was created to maximize users’ motivation and involvement in the early stage of innovation. It uses a combination of game dynamics, mechanics and components, inspired on the 6D framework (Werbach & Hunter, 2015) which was designed for a team of between four and six players and can be played multiple times by the same team playing different ideas or by multiple teams playing the same idea. It is a scientific and market validated approach with a proven track-record in idea development and co-creation that follows the 6D or six steps to gamification framework (Werbach & Hunter, 2012).

ideaChef®’s level of compliance with the “Game Elements and Hierarchy” gamification framework (Werbach and Hunter 2015) is described in table 3. Having a high level of compliance with this comprehensive and widely accepted gamification framework, ideaChef® was considered a good method and tool to support the intervention and achieve the desired goals.

Table 3. Compliance with Game Elements and Hierarchy framework

Game Elements Framework	Game Elements of ideaChef®
Dynamics	Rules requiring users to answer different types of questions within defined time windows, as well as choices and tradeoffs like buying a card or providing expertise; Range of emotions seeking to invoke recognition, happiness and creativity among others; Narrative reporting a coherent experience related to the concrete challenge/problem; Different challenges like the power cards as the user progresses in the game; Players depending on one another in order to achieve contributions for all the blocks and thereby designing the solution (“recipe”).

Mechanics	A set of questions requiring some effort to solve like time, knowledge and creativity; Elements of randomness by using the dice; Group and individual competition; Cooperation, since everyone must work together to achieve the best solution (“recipe”); Feedback on how players are performing every two minutes; Transactions where players can trade with each other directly, like paying for expertise; Rewards for players who complete the individual board with contribution for all categories; Teams can play up to six rounds.
Components	Points that show player performance and progression; Achievement of objectives (give contributions) that result in one player winning; Aspects of the game (power cards) available only when players complete one or two regular rounds; Group of between 3 and 6 players working together towards a common goal, i.e. designing the best solution (“recipe”) for solving the challenge/problem; Visual displays of team progression, i.e. number of rounds; Quests that are defined ahead of time for players, i.e. provide contributions for all the categories.

Data analysis

Data gathered from firms that participated in the speed date meetings (see table 1) were grouped into the key drivers and constraints of collaborative innovation practices expressed in the context of the Co-Create project. Data analysis was based on the perspectives of firms wanting to cooperate with key suppliers and thereby co-create value, as mentioned in the literature.

Regarding the case study conducted during the second step (see table 2), a thematic analysis was used for analyzing, organizing, describing and reporting patterns, within the data collected (Braun & Clarke, 2006). Data from the interviews with gamification workshop participants was grouped into four themes (see figure 1).

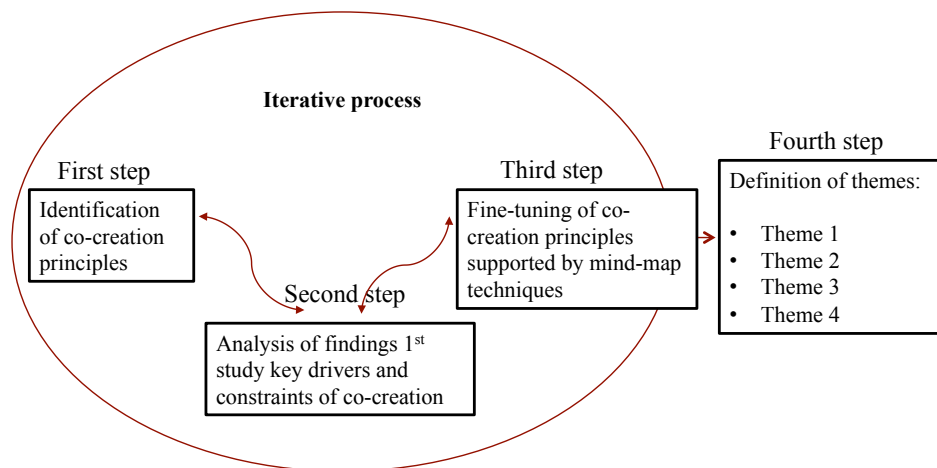


Figure 1. Coding diagram

An iterative process allowed us to define four complementary themes. First, discussing the principles identified in the literature from the perspective of users/customers, suppliers and designers involved in the co-creation practices. Second, cross-checking

these principles with the results of the first study. Third, making relevant adjustments for the early stage of innovation, which is still characterized by high levels of uncertainty and risk. Lastly, defining the final themes. Mind maps, which were continuously improved over time, in an iterative process, supported the coding approach and facilitated both the selection of themes and comparative data analysis processes.

The comparative analysis from the perspectives of the customer, supplier and designer in relation to all four drivers of co-creation is summarized in the next section of the findings, where self-explanatory quotes from the interviews are decoded and used to explain particular aspects of the co-design process.

Data collection and the analysis process ensured the quality of the research. Case study research design together with the two empirical studies enabled the triangulation of the findings. In fact, results from the first study provided valuable insights on how to approach co-creation and also helped generate the themes for the second study. Apart from this, the clarification of the procedure used to define the themes (see figure 1) facilitates its application in other research settings.

Findings

First Step

The main goal of the preliminary study conducted during the first step was to gather insights on collaborative innovation practices from the firm’s representatives that participated in a Co-Create project initiative called speed date meetings. The observations contributed to a better understanding of the key drivers and constraints of collaborative innovation practices in the context of this particular initiative that supported cross-fertilization processes between creative and traditional firms (see tables 4 and 5).

Table 4. Key drivers

Drivers	Representative quotes from participants
Promotion of information sharing and transparency	<ul style="list-style-type: none"> • Sharing ideas is something that gives you an added value. Sometimes you are so worried about secrecy, you forget that when going to a trade fair you are already very exposed to your competitors (participant #3 from Traditional Firms). • Maybe this project will make our people understand the importance of being open. Smaller firms do not have the resources to find, internally, all the solutions, so we need to open up a little bit more and talk to other experts in order to find the best solution for our customers (participant #4 from Traditional Firms). • We do not think we have any issue with sharing our vision with others. It is not by sharing our PowerPoint that we might have a problem; we need to be more open and talk with people to find a solution (participant #4 from Traditional Firms). We were free to share our business views and not to zealously hold on to our value proposition, which is normally what the people who work at the firm do (participant #4 from Traditional Firms).

	<ul style="list-style-type: none"> As a creative firm, our job is to bring together different people and ideas, creating something new for our customers. Like this, you do not waste your time and are able to bring to fruition the customers' dream (participant #1 from Creative Firms).
Creation of a networking environment	<ul style="list-style-type: none"> Most of the briefings were pretty clear with only a few a bit blurred; so, all the dialogue and communication placed us in a good position to develop something further (participant #2 from Creative Firms). We have received very positive feedback. One firm has already engaged with us and told us that they want to work with us (participant #2 from Creative Firms). We have found firms to be very open and friendly; and, honestly speaking, they are very curious (participant #2 from Creative Firms). I have worked for this firm for more than 20 years and I do things automatically, even if I always try to be open-minded. That is why having the possibility to stop and observe other firms and be seen by these other firms in a different way is quite interesting (participant #3 from Traditional Firms). Our group was making an accessory for a new project, whilst another supplier was making some other components in aluminum for the same customers. However, we did not network and it would have been interesting to speak to one another (participant #3 from Traditional Firms).

The quotes by the participants show the importance of building a networking environment, which promotes dialogue and encourages information sharing and transparency. Both parties, i.e. suppliers (participants #1 and #2) and customers (participants #3 and #4) recognize the need to share information in order to facilitate communication and knowledge about each other's goals and interests.

Table 5. Key constraints

Constraints	Representative quotes from participants
Lack of mutual understanding	<ul style="list-style-type: none"> Sometimes there is some frustration when we are talking about specific characteristics of the product and the other party/person cannot fully understand what our problems and needs are (participant #4 from Traditional Firms). We sometimes lack expertise in the customers' business (participant #1 from Creative Firms). I told you that we produce furniture handles, but if I issue a brief on what new handles I would like to receive, I will probably receive proposals for different shapes. Yet, I am not looking for a new handle shape but rather to redesign or rethink strategically what the intended purpose of the product is (participant #3 from Traditional Firms). We do not make final products but accessories, so the furniture is the star and our products should respect the furniture. That is the most difficult thing to pass on to designers because if the designer does not know this particular furniture accessory market, they are going to look for a solution for the product, i.e. the furniture and not for the accessories (participant #3 from Traditional Firms).

Lack of engagement and empathy	<ul style="list-style-type: none"> • We were slightly frustrated by not having a clear answer from the other party. I could not understand if the person in front of me, representing the firm, really appreciated what we presented and wished to develop further, or they just wanted to pick up some ideas (participant #1 from Creative Firms). • We find it more difficult to communicate with local firms than with firms from other countries (participant #2 from Creative Firms). • You cannot always be sure of the loyalty of the other party, it is both a challenge and a risk, but it is part of our activity (participant #1 from Creative Firms).
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Findings from this preliminary study draw attention to issues like dialogue and engagement, which need to be addressed when trying to overcome typical difficulties that arise during the co-creation of new solutions.

Second Step

The case study provided important insights on how gamification enhances the co-creation of innovative concepts in a collaborative environment. These insights are structured in four core themes, grounded in the first step findings and the co-creation principles.

First theme: Dialogue

There are several arguments to support the view that gamification enhances the co-creation process by facilitating dialogue and communication among team members from different backgrounds and interests (see table 6, first theme).

Table 6. First theme: Dialogue

Perspectives	Representative quotes from participants
Customer	<ul style="list-style-type: none"> • It was absolutely great to work with people outside my organization. I did not feel any type of constraint. I could express myself without any problem and also think that the other people were also sharing what they had in mind. As (the designer) demonstrated a couple of times, providing some criticism of the project is not an issue. I think we were all in a good mood when discussing things. • I do not think there is any risk in working with externals, you have to go through this process of sharing doubts, ideas and intentions, since you do not have any other option. But in some other situations, e.g. an already established business, I could feel a bit constrained to be forced to share and receive contributions.
Supplier	<ul style="list-style-type: none"> • I cannot see any risk in having people that are not (directly) involved in the process. In fact, introducing an external designer was good and useful because he found some specific things, we could not have easily come up with ourselves. It also probably allowed for a better understanding of the process. • Sometimes we are far too concentrated on our fieldwork and it is good to hear different points of view from other people.

Designer #1	<ul style="list-style-type: none"> I felt comfortable working with a diverse team. For us, designers, it was quite natural, but I cannot speak for other people working in firms. It was a good opportunity to work with the customer on this concept, but maybe he was not satisfied with some of the criticism regarding his personal views. It was also very interesting to see how the other designer, who had not been previously involved in anything related to the project, made a good contribution.
Designer #2	<ul style="list-style-type: none"> I was external to the project, so a lot of things surprised me, but it was not difficult to work with the other people.

Second theme: Structured approach

There is a lot of strong evidence to support the idea that gamification enhances the co-creation process by providing a more structured and coordinated approach (see table 7, second theme).

Table 7. Second theme: Structured approach

Perspectives	Representative quotes from participants
Customer	<ul style="list-style-type: none"> The gamification process is like brainstorming, but it always gives one the possibility to refocus and get back to the main topic being talked about. This approach contributed to higher engagement because we were playing. It is great because it keeps the conversation rolling, where everybody is largely on the same page. And, if someone proposes something stupid, then you have to recognize that and discuss it. It is another point of view and you have to consider it in a critical manner. I think it is a good tool to have.
Supplier	<ul style="list-style-type: none"> Since the process is structured like a game, it probably increases the involvement of a wide range of people. I think sharing ideas is a good process. It is a more structured way to do brainstorming. It was easier and clearer to achieve some results during the process. In the beginning, it is a bit difficult, but during the process, you feel more comfortable because you become more confident with the other people and the process. This provided the customer with a more aligned and structured thinking process, and the same was true for the other participants. We are now thinking about the same problems and points, sharing a common vision of the project. This process is very useful when it comes to generating concepts.
Designer #1	<ul style="list-style-type: none"> The session was like brainstorming, but it was much more structured since it put everyone at the same level, so it did not matter if you were with someone from a different sector. The game is good for involving people because it is not static and is also enjoyable. It is a good thing to mix different ideas because it is good for the customer, but not only for the customer. I also returned to my work with new knowledge. It obviously increased team spirit. I think the supplier is now closer to the customer. It was also very interesting to see how the other designer, who had not been previously involved in anything related to the project, made a good contribution.

Designer #2	<ul style="list-style-type: none"> • As explained, this process was not completely linear since, over time, we encountered different questions from different topics and some overlapped, so the discussion kept going back to certain topics. We were able to better understand which issues were more important to discuss, as well as the topics on which there was more disagreement or agreement. So, we went in the right direction faster. • The rules of the game were easy to follow. The only thing that maybe was a bit difficult was, on occasions, to stay on time. But it was more difficult in the beginning and then it became easier over time. As the other designer said, you realize that everything is linked and it is easy to follow the circular process with the six parts of the board. • It is easier to speak and to be clear about an idea and also to be more open, i.e. agree or disagree with some points. In fact, it surprised me how ideas were coming out in such a short period of time, especially when we were required to write down our answers. • This approach contributed to a higher engagement by team members. I also loved the fact that you never knew what the next question was. I remember the second time I threw the dice and picked the same topic card. I said, “No! I do not want to answer on this topic again!” Afterwards, however, it was great because I already knew something about the topic. I also felt a bit of suspense when it was my turn to pick a card, since I kept hoping that this time it would be easier to answer. These kinds of things are really engaging. • The way it was put together, with different categories and specific questions, facilitated the exchange of knowledge especially with people from different backgrounds. I often experienced people speaking about one thing and then thinking about another, even with people from the same background, especially when speaking about non-tangible things. When speaking about a product it is easier, but for some strategic issues it is still difficult to talk about the same thing. So, this kind of game was really powerful in tackling single problems at any given time and grouping them together. • At first, it was a bit difficult because I did not know the customer and I was external to the project. But I think this kind of game, especially when people begin to tackle more sensitive issues like the things people want to discuss more, provides a discussion environment where people are not worried about what they are going to say. In the beginning, I kept wondering whether the evaluation was really important but, in the end, I believe it was really important because it was not just evaluating the idea but more about reaching consensus. So, it was easier to understand if everybody was in agreement or if it was just a personal thought.
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Third theme: Quality of the solution

Multiple types of evidence support the view that gamification contributes to enhancing the co-creation process by delivering a good report of the concept, which reflects the quality of the solution designed by the team during the gamification session (see table 8, third theme).

Table 8. Third theme: Quality of the solution

Perspectives	Representative quotes from participants
Customer	<ul style="list-style-type: none"> I am completely satisfied with the draft of the concept that we achieved and I still think that we need to arrange a second gamification session. I think we got a little bit ahead of ourselves with regards to the things we usually do not consider when we are only focused on the product, such as our market communication. So, we will have to spend more time on the draft report because we went through it too quickly.
Supplier	<ul style="list-style-type: none"> I was satisfied with what we achieved in the end. As has already been said, the game was very useful.
Designer #1	<ul style="list-style-type: none"> I am very satisfied with the report of the session. The final phase was the main part of the session. I was really surprised by the end result; we accomplished a lot of very interesting things.
Designer #2	<ul style="list-style-type: none"> I am satisfied with the final draft idea because I am always a bit skeptical about some kinds of games. Because, when you start, you do not immediately see the outcome and, at the same time, you do not feel free. But in this game, I felt really free and that is why I loved it: it was well-structured and I felt free to answer. There were some constraints, but if you wanted to say something not linked to the question, you could say it and it was still considered valid for the final outcome. The tool was pretty much aligned with the co-creation. My only issue is, probably, the timing. I do not know the firm's real situation and how they will be able to implement what they initially had in mind. Probably the riskiest thing is to co-create something together and then not go ahead with it together. Sometimes, there can also be some misunderstandings as regards the outcome if there is not a clear and concrete report. It may happen that when you finish, everyone seems to have the same idea but after a few days things can change and then you will need to go back to the co-creation.

Fourth theme: Creativity

These findings strengthen the view that gamification enhances the co-creation process by providing collective creativity experiences for participants (see table 9, fourth theme).

Table 9. Fourth theme: Creativity

Perspectives	Representative quotes from participants
Customer	<ul style="list-style-type: none"> There were some good insights from everybody, even from people that were not directly involved in the project, like the facilitator and the other designer. Moreover, it really worked out.
Supplier	<ul style="list-style-type: none"> I think it promoted more creative thinking because it was possible to clarify some points that, individually, we would not have understood. Having other people in the process can make it clearer.

	<ul style="list-style-type: none"> I did not find any surprises in terms of insights but I think they are much clearer now.
Designer #1	<ul style="list-style-type: none"> For creativity, maybe different tools, more material or dynamics like drawings can be used, instead of using a board whilst seated at the table. Just maybe, moving around will further increase creativity. Maybe it was easy (to be more creative) because we were designers. And for creative people, it may be simpler.
Designer #2	<ul style="list-style-type: none"> I think that we got really good insights because I overheard what the customer was saying when we started the game. After the game, the concept became really interesting and different in respect to what the customer was initially trying to do.

Representative quotes from the participants' debriefing interviews (see table 10), collected immediately after the gamification workshop, reinforce the importance of the second (structured approach) and third (quality of the solution) themes.

Table 10. Debriefing interview

Key themes	Representative quotes from participants
Structured approach	<ul style="list-style-type: none"> We like the gamification approach because it is interactive: it is a game and not a common tool. It is similar to brainstorming but more attractive and interesting and also more structured. It is always good to have a structured path, because with brainstorming you start with something and sometimes it may go in the wrong direction thereby wasting a lot of time. Having something that keeps your mind on the main topic is great.
Quality of the solution	<ul style="list-style-type: none"> It is also interesting to see the final results because I did not expect them! I was surprised. Because there is a real structure and, in the beginning, I did not imagine that we could achieve such a result. From the first report question to where we ended up was a big step.

Discussion

First Step

All customers and suppliers were open to sharing information and giving access to data on strategy and business processes to the other party. It seems that the format of the speed date meetings enabled suppliers to engage with customers, which is usually quite hard to achieve. These attitudes towards suppliers reflect the characteristics and size of the customers in question, typically SMEs, which are forced to establish partnerships and engage with innovative suppliers in order to remain competitive. This finding is in line with the current knowledge, which stresses the need to interact and cooperate with suppliers for the co-creation of new solutions (Galvagno & Dalli, 2014; Prahalad & Ramaswamy, 2004).

Constraints related to lack of engagement/empathy and mutual understanding clearly highlight the difficult challenges involved in managing multi-actors and supporting them

in knowledge creation (Huxham & Vangen, 2004; Ollila & Yström, 2016). Difficulties in communication and quotes from the participants expressing frustration serve to mirror the nature of co-creation environments usually characterized by high levels of uncertainty (Grönroos & Voima, 2013; Sanders & Stappers, 2008).

It was also found that it is almost impossible to ensure close interaction with different stakeholders and co-create new solutions without having a clear understanding of customer needs. In fact, the customer tends to become frustrated with the supplier's difficulty in understanding their business and the job that needs to be done (Christensen, Hall, Dillon, & Duncan, 2016).

Findings from the interviews are complemented by the observations of the speed date meetings and project documentation. The project briefings and observations support the views expressed by the participants regarding information sharing, communication, empathy and transparency. Additionally, it seems that the positive feedback received from most of the participants is a consequence of a comprehensive process of project preparation, involvement and coordination of all actors, as described in the speed date meetings Co-Create project methodology document.

As discussed by participants, it is critical to clarify the intention, purpose and need for collaboration, which unfortunately is often not done in a sufficiently clear manner. Implications of the findings suggest that firms from traditional and creative sectors need to recognize that they can always learn from each other and innovate together, increasing their competitiveness in the marketplace and the ability to catch up with the economic, social and technological trends.

Another relevant observation was the role of the facilitators. The experience and abilities of the facilitators who led the project initiative were a determinant factor in achieving concrete results and participants' engagement. Furthermore, it seems that this type of support should also be extended over a longer period of time, including the phases where participants want to convert this initial collaboration into reality and then keep it alive, since it is beneficial to both parties.

Second Step

Dialogue

The difficulty in managing multiple stakeholders with expected conflicting agendas and views could sometimes be a major difficulty. However, gamification helped to build a networking environment where everyone was feeling free to express their inner thoughts, even if it meant sometimes going against what others were suggesting. In spite of the concerns by one of the designers about their expressing some criticism of the initial idea, the customer handled opposing views very well. Therefore, it seems that one of the main advantages of gamification was to get these stakeholders working together on a project in a collaborative and friendly environment, which is the one of the main drivers of co-

creation (Ramaswamy & Gouillart, 2010). Workshop observation supported the view that gamification has the power to support the interaction and exchange of ideas among multi-actors in a more open environment (Baldwin & von Hippel, 2011).

All parties (customer, supplier and designer) recognized that having an outsider, and particularly a designer, was much appreciated, resulting in non-biased views and greater breakthrough contributions to the discussion. Contributions were very balanced and subject to a peer-review process, which encouraged good contributions no matter the role of the participants. This outcome calls attention to the important involvement of intermediaries in collaborative innovation practices (Agogué et al., 2013; De Silva et al., 2018; Ollila & Yström, 2016). Designers are typically open to discussing ideas and are generally more able than suppliers to contradict customers' specific views, which could be a good argument for the future involvement of designers in co-creation.

Structured approach

Gamification enhances the co-creation process by providing a more structured and coordinated approach. This finding is most significant when taking into account the difficulties in managing multi-actor knowledge creation (Huxham & Vangen, 2004; Ollila & Yström, 2016).

As mentioned in the interviews, everyone considered this gamified approach a sort of brainstorming but much more structured and powerful in terms of engagement. Workshop observations demonstrated very strong consensus around the two issues that explain higher team engagement with the co-design process: i) the novelty of using game elements; and ii) providing a clear structure that facilitates open discussion, team alignment and the achievement of concrete results. This observation supports the argument that gamification approaches to innovation have the potential to deal with these issues. In fact, the game mechanics, such as the need to stay on time, randomness challenges, which introduce elements of surprise, and clear rules that ensure everyone stays focused on the process, clearly improved participants' engagement in the co-creation session.

According to the designers' perspective, this structured and coordinated process allows customer and supplier to work more closely with each other and overcome the lack of mutual understanding identified in the preliminary study. Encouraging the participation of all and giving everyone the same opportunity and time to share views contributes significantly to higher engagement and consensus building, as recognized by all parties. By cross-checking the debriefing and relevant interview quotes, observations and project documentation, it becomes easier to understand the need for a structured platform to interact and also ensure the high engagement of all stakeholders (Ramaswamy & Gouillart, 2010).

Quality of the solution

Despite all the work done and information gathered up to the start of the workshop, it was interesting to observe the surprise on the faces of participants when they got a good concept report immediately after having concluded the half-day workshop session. The customer revealed that this particular approach was extremely useful for providing a clearer picture of the idea and its main market implications. The overwhelming interest in conducting a second workshop session to improve the results achieved during the first is a good indicator of its value as perceived by the customer.

As mentioned by participants, this gamified approach makes intangible thoughts more tangible and clearer by delivering a self-explanatory report on the proposed solution. It seems that applying gamification has resulted in increased collaboration capabilities and improved the co-design process with a clear return for all stakeholders. All these findings support the views that gamification approaches offer a substantial payback and multi-actors only engage in co-creation when this type of approach produces value for them (Ind & Coates, 2013; Ramaswamy & Gouillart, 2010).

Creativity

Existing literature suggests that the generation of value through interaction in a collective creative environment is a key ingredient of the co-creation definition (Frow et al., 2015; Galvagno & Dalli, 2014; Grönroos & Voima, 2013; Sanders & Stappers, 2008). From the customer and supplier's point of view, the gamification approach facilitated the generation of valuable insights, which transformed blurred market issues into clear directions. Workshop observation supported these views and disclosed how the participants were able to join the dots and end up with clear insights.

On the other hand, designers have mixed views regarding the enhancement of creative thinking. Eventually, because of the nature of their role and the existence of other creative approaches, one of the designers felt that more creative tools and methods should be introduced into the co-design process. The other designer, however, related the interesting results of this creative experience to the good insights generated throughout the session.

Conclusion

The empirical data has been used to gain insights into the link between gamification and value co-creation. The findings suggest that gamification plays a key role in supporting the co-creation of new solutions, which is outlined in four building blocks: i) dialogue; ii) structured approach; iii) quality of the solution; and iv) creativity.

Gamification enhances co-creation by providing a peer-to-peer structured approach that ensures close interaction between different actors, encourages contributions from all

participants and supports high-quality knowledge creation in an open and creative environment. Furthermore, what stands out from this study is the combination of the two key factors, i.e. engagement and coordination, in which gamification differs from the other approaches that already use game elements.

In fact, the main contribution of this paper is the suggestion that engagement goes hand in hand with coordination and that a combination of both will be the best strategy for co-creating new solutions through gamification. It seems that the combination of these two factors provides the performance level required to support effective and high-quality co-creation of new solutions. This result acknowledges that engagement by itself is not able to support the co-creation of new solutions. Although actors may be engaged in the process because it is playful and more relaxed, coordination is necessary to maintain the focus on the project goals, which ensures the quality of solutions. This particular concern justifies the need for actors to follow a more structured process when co-creating new solutions.

All these new insights have implications for both the theory and practice of collaborative innovation. Gamification can be applied to tackle the central issues of collaborative innovation, more specifically its dynamics and messy nature that is a consequence of the challenges of managing multi-actors in knowledge creation. This type of approach can also be used to solve research problems related to actors' alignment and participation in complex collaborative environments, e.g. conflicting parties reaching out for consensus.

Gamification has shown positive results, which reinforces the notion that it works particularly well when applied to situations where new solutions are co-created by a diverse team, i.e. multi-actors with different roles, backgrounds and knowledge. Proper multi-actor engagement comes from intangible factors like motivation and novelty, as well as from more concrete ones like the final reporting of a high-quality concept. Representative quotes from participant interviews and workshop observations are clear and coincide as regards this unique and rewarding experience, illustrating how gamification provides a more engaging and powerful platform for multi-actors' dialogue, mutual understanding, alignment of goals, creative experience sharing and concept development. They emphasize, moreover, the role of gamification in bringing different people together to talk and share information in an open, structured and creative environment.

The boundaries of this research study were established in advance: it is clearly focused on the application of gamification with reference to businesses, where multi-actors join efforts to develop valuable concepts in an open and more creative environment. Therefore, it excludes situations where gamification approaches do not have a business goal or others related to pure-play environments only. Still, there is an important limitation attached to the type of firms involved in these empirical studies. It should be kept in mind that all the firm's representatives who participated in the Co-Create project

activities were very open-minded professionals and enthusiasts of collaborative innovation environments. Even those representatives from traditional industry firms were used to working with external actors and were not averse to new approaches. So, it would be interesting to test whether the gamification approach to co-creation would have the same good results in cases of sectors that are less open to collaboration and interaction with external actors or less mature in terms of collaborative innovation practices.

Many other avenues for further research can still be investigated. First, to explore in depth the role of designers in co-creation or co-designing of new-solutions. Having designers on board provides a good opportunity to address questions, as well as to introduce bolder ideas and different inputs that are often left out of typical customer and supplier discussions. Besides this, it seems that the designer can be seen as a new type of innovation intermediary in the co-creation of new solutions by mediating and triggering the relationship between the customer and supplier, in addition to facilitating knowledge creation.

The second is to develop a new type of gamification approach to address a particular setting of idea/concept deconstruction. Instead of looking for ways to improve and develop the idea/concept, it could be interesting to test whether the gamification approach to co-creation works for trouble-shooting and identifying the hidden problems and limitations of an existing idea/concept. A third area could be to clarify the roles and influence of different actors engaged in co-creation collaborative innovation practices, disclosing their behaviors, concerns, motivations and expectations.

In conclusion, this paper bridges the theory-practice gap on gamified co-creation approaches by providing substantive contributions, which advance scholarly understanding of how gamification enhances co-creation in the context of collaborative innovation. Results demonstrate that the gamification approach supports the engagement and coordination of all key actors in the co-creation of new solutions by encouraging continuous dialogue, interaction and learning, which really drive long-term relationships and knowledge building.

APPENDICES

Appendix 1

Semi-structured interview questions for firms participating in the speed date meetings

Today's session	Expectations for the next phase of the project
1. Did you enjoy today's session? Why? 2. How would you qualify the value and dynamics of this creative approach as a whole? 3. What is your opinion about design-driven methods and tools to support the co-design of innovative solutions? 4. Did you face frustration or openness in sharing views and opinions during the meetings?	5. What are your expectations regarding your involvement in this project? 6. What do you think of having team members with different experiences and views working together to co-create better solutions?

Appendix 2

Debriefing interview questions for gamification workshop participants

Interview Guide
1. Did you enjoy today's gamification workshop? Why? 2. What is your opinion regarding the ideaChef® game elements and process? 3. How would you qualify the value and dynamics of the whole project, i.e. the speed dating meeting and the present gamification workshop?

Appendix 3

In-depth interview questions for gamification workshop participants

Interview Guide
1. How would you describe the process of (innovative solutions) co-design among the team members? 2. What do you think of the insights produced by the team members? Were there any surprises? 3. How did you feel working in a team environment with other people from outside your organization? 4. How satisfied are you with the value of the solution ("recipe") co-designed by the team? 5. Are you aware of the risks of collaborative working? 6. To what extent do you consider that a gamified approach like ideaChef® contributes to team members being more highly engaged? 7. To what extent do you consider that a gamified approach like ideaChef® contributes to knowledge building and sharing among team members? 8. To what extent do you consider that a gamified approach like ideaChef® contributes to enabling creative thinking? 9. To what extent do you consider that a gamified approach like ideaChef® contributes to increasing team spirit and consensus building?

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