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## Gamification in innovation teams

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### ABSTRACT

The paper examines the relationship between gamification – the use of game elements in non-gaming contexts – and innovation teams' outcomes. It builds on psychological and teamwork theories, arguing that gamification overcomes collaboration issues and generates multiple positive outcomes, particularly in coordination, alignment, engagement, and teams' motivation. The research follows a qualitative theory-driven using a case study of an innovation project. The conceptual model built through the findings offers valuable insights about applying gamification in innovation teams, namely: i) surprising teams with such a new and playful approach reduces stress among team members; ii) rules and time constraints play a crucial role in teams' coordination by avoiding dispersion and enhancing focused efforts. The paper provides a set of testable theoretical propositions derived from the conceptualization of gamification in the context of innovation teams. It supports innovation managers interested in measuring gamification outcomes in teams.

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## 1. Introduction

Gamification can be defined as the use of game designed elements in non-gaming situations to encourage users' motivation, enjoyment, and engagement, particularly in performing a difficult and complex task or achieving a certain goal (Deterding et al., 2011; Harwood and Garry, 2015; Robson et al., 2015). Given its characteristics, the introduction of gamification approaches in the workplace is becoming increasingly popular, both inside and outside the organization. Gamification can be applied to many different business functions involving participants within an organization, e.g., "to improve employee engagement or outside it", e.g., "to co-develop products with users" (Piligrimiene et al., 2015; Robson et al., 2014; Ruhi, 2015). The motivations to engage in a gamified experience include utilitarian (e.g., playfulness and enjoyment), hedonic (e.g., cognitive and usefulness) and social outcome dimensions (e.g., recognition).

While considerable progress has been made in the literature, studying the relationship between gamification and user/employee engagement (Robson et al., 2016; Suh et al., 2018), the link between gamification and innovation teams has not been extensively considered. Teams are a basic form of human cooperation in firms, where typical team members are assigned and managed by team leaders (Foss and Lindenberg, 2012). Despite its growing adoption, the management of teams

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involved in firm projects shows several concerns regarding its performance and effectiveness, such as the conflicts among the team members in goal setting (Locke and Latham, 2006) and goal alignment (Mascareño et al., 2019). This paper builds on psychological (e.g., self-determination and goal-setting) and teamwork theories, arguing that gamification overcomes collaboration issues and generates multiple positive outcomes, particularly in coordination, alignment, engagement, and motivation of teams.

To fully understand the relationship between gamification and innovation teams' outcomes, this paper follows a structured Straussian approach, focused on data interpretation and constant comparison with literature (Corbin and Strauss, 2015; Strauss and Corbin, 1998). A theory-driven coding approach demonstrates connections between data and theory through a thematic analysis approach (Braun and Clarke, 2006; Gioia et al., 2013). This method is appropriate as it facilitates a more comprehensive understanding of such an emergent phenomenon (Goffin et al., 2019; Kindström et al., 2013; Ponelis, 2015; Yin, 2009). The research question – How can gamification approaches generate positive outcomes in innovation teams? – was addressed by deploying a gamified approach in a case study firm that involved innovation teams in corporate challenges. As a result of this research question, two objectives were defined: i) to apply gamification in innovation teams in a particular business environment, and ii) to identify the positive outcomes of gamification. As such, a case study was conducted with a combination of different instruments, including workshops, follow-up meetings, and interviews.

This paper's originality rests on gamification approaches in innovation teams. The topic is worth investigating because of its theoretical motivation and implications. It offers important directions for future research on innovation management and real-world inputs on how gamification works to achieve hedonic, utilitarian, and social outcomes in innovation teams. A conceptual model built through the findings provides essential managerial contributions on how, why, and when gamification may improve corporate teams' performance and effectiveness. Gamification can provide teams with a better system to solve problems and manage innovation. E.g. managers can use gamification to involve all team members more effectively, make work tasks more enjoyable, boost motivation, and increase engagement with workplace activities.

The paper is structured in six sections. After the introduction, Section 2 addresses the literature review on gamification and innovation and teamwork. Section 3 presents all methodological steps followed during the research. Section 4 presents the findings subdivided into hedonic, utilitarian, and social outcomes. Section 5 discusses the main findings, and Section 6 presents the conclusions.

## 2. Theory

### 2.1. Teamwork and innovation

In response to complex business challenges, firms are extensively adopting work teams embedded in a multilevel system focused on knowledge task-relevant processes dealing with the individual, team, and organizational level aspects (Jiang, 2010; Kozłowski, 2018). Teamwork is growing fast since it makes people share the same goals and responsibilities for outcomes (Hong and Gajendran, 2018) and provides incentives for achieving innovative, complicated change efforts in organizations (Webber et al., 2019). Another strong argument for organizations to use teams in crucial projects is to lower the search costs of identifying the required knowledge by bringing together individuals with diverse but appropriate expertise and backgrounds to complete complicated and often unclear knowledge activities (Hong and Gajendran, 2018).

While observing a growing adoption of teams, its performance and effectiveness decline due to the following difficulties: failure to integrate members with different expertise and diversity of perspectives (Vestal and Mesmer-Magnus, 2020); lack of strategic alignment across the organization and conflicts among the team members in goal setting (Locke and Latham, 2006; Vestal and Mesmer-Magnus, 2020); disengagement from the previous tasks (O'Neill and Salas, 2018); cognitive load and anxiety (An et al., 2020); negative emotion (Kozłowski, 2018); social clashes, and misunderstandings and uncoordinated actions of shared leadership (Nordbäck and Espinosa, 2019); and stress and fatigue (Stoverink et al., 2020).

Setting goals is a typical example of an issue that conduct to a decline in teams' performance. It was observed that goal setting in teams adds a layer of difficulty compared to an individual's goals due to conflicts among the team's members (Locke and Latham, 2006). Teams must set hard goals to achieve high-performance levels and effectiveness in their objectives (Dulebohn and Hoch, 2017). But, despite their difficulty, hard goals lead to a higher motivation and task performance than easy goals (Locke and Latham, 2006).

Several other factors contribute to overcoming the difficulties mentioned above. There are pieces of evidence for the importance of team cognitive processes (such as team cognition and cognitive climate), motivational processes (e.g., cohesion, efficacy, mood, and emotion) and behavioral processes (e.g., coordination, cooperation, communication and regulation and adaptation) to yield team performance and effectiveness (Dulebohn and Hoch, 2017; Kozłowski, 2018). Furthermore, many of the performance gaps are not caused by a lack of knowledge and skills but due to a lack of motivation and strong ties between team members (Clark, 2003).

Furthermore, it has been found that adequate and appropriate use of teams is critical to solving problems and better managing innovation. Innovation in teams encompasses the generation (creativity) and execution of original and feasible ideas (solutions) by a group of individuals working interdependently (Byron et al., 2022).

Motivation is concerned with the factors influencing innovation teams to behave in specific ways. Teams need to be intrinsically and extrinsically motivated and engaged in social and cognitive developments to drive innovation forward (Byron et al., 2022). Team building exercises, off-sites, and peer mentorship systems encourage sharing ideas, discussing

varied points of view, managing conflict, and promoting more motivation and stronger ties among team members (Byron et al., 2022; Hong and Gajendran, 2018). Consequently, more motivated teams show high confidence, trust, collaborative spirit, optimism, and values about work (Clark, 2003). Other approaches, such as inter-team competition or cooperation, also improve motivation and productivity. This competitive and, at the same time, collaborative approach has an immediate positive effect on companies' ability to shorten time-to-market from the imagination through its product launch (An et al., 2020).

Teams are part of the organizational factors that may encourage or constrain innovation, which requires investment in team selection and building (Tidd, 2021). Fostering innovation also requires mechanisms to effectively integrate team members' distinct expertise and leverage interdisciplinarity (Vestal and Mesmer-Magnus, 2020) by providing ways to identify and focus on new ideas and have different members combine and elaborate on these ideas (Byron et al., 2022). There is also a call for supportive top management to set clear innovation goals and provide organizational support (Yu et al., 2022), i.e., leaders that inspire and ensure all team members share the same compelling vision and are equally involved in critical innovation tasks (Dimas et al., 2022; Mascareño et al., 2019). Furthermore, innovation teams benefit from continuous learning approaches that encourage learning behaviors, stimulate communication and facilitate knowledge sharing (Dimas et al., 2022).

A rich body of research has endorsed the aspects of motivation and training in building effective innovation teams. However, in the literature on teamwork, insufficient attention has been paid to gamification, which is especially relevant as an essential driver of team motivation.

## 2.2. Gamification

The term gamification was shaped in 2002 by game designer Nick Pelling (Dale, 2014; Galetta, 2013) but only evolved and got a widespread interest in the 2010s with the most common definition in the literature, i.e., the use of game-based elements in non-game contexts to encourage users to perform desired behaviors (Deterding et al., 2011).

Contributions to the literature on gamification have been particularly focused on education and learning (Attali and Arieli-Attali, 2015; Simões et al., 2013), health (McKeown et al., 2016), marketing and consumer behavior (Lucassen and Jansen, 2014; Rodrigues et al., 2016), as well as on social behaviors (Schoech et al., 2013).

Despite the growing body of knowledge, gamification is still a recent concept. It should not be confused with others, such as play, traditional games, or even reward systems and loyalty programs that merely persuade people to perform actions to earn points (Ruhi, 2015). Gamification is more than a technical process of applying game elements and tools to provide fun and enjoyment (Harwood and Garry, 2015; Suh et al., 2018). It generates diverse game dynamics, such as rewards, competition, altruism, and self-expression, supporting the satisfaction of employees' psychological needs, e.g., autonomy, competence, and relatedness (Mitchell et al., 2020; Suh et al., 2018).

The selection of game elements like rewards and competition level depends on what really motivates and keeps people engaged (Dale, 2014; Galetta, 2013). Since game elements per se do not automatically create a better engagement with participants, gamification approaches need to involve the application of psychological theories like self-determination theory (SDT) (Deci and Ryan, 2000) and goal-setting (Locke and Latham, 2006) along with user-centered design perspective (Norman and Draper, 1986; Schoech et al., 2013).

User-centered design principles are complemented with human motivators to guarantee a truly player-centered experience, i.e., the right ingredients for making a game experience work for the participant (Kumar and Herger, 2014). Achieving this balanced experience is essential since, under this perspective, engagement can only be achieved when the user is completely immersed in a challenging and interesting task and falls into a flow state, which can be defined as a feeling of happiness and inspiration associated with playing a game that prevents the user from getting bored (Galetta, 2013; Kumar and Herger, 2014; Ruhi, 2015).

From the perspective of SDT, human behavior may be extrinsically or intrinsically motivated (Hamari and Koivisto, 2015; Mekler et al., 2015). Extrinsic motivation refers to motivations arising from an external source (i.e., prizes, money), such as being motivated to perform a task to receive financial compensation (Hamari and Koivisto, 2015). It is defined as doing something due to an extrinsic reward in the form of money or verbal feedback, e.g., praise (Mekler et al., 2015). Intrinsic motivation refers to motivations arising from an internal source (i.e., fun, enjoyment, self-purposeful behavior), such as being internally motivated, without external forces affecting the will to act (Hamari and Koivisto, 2015). It means pursuing of an activity, simply because it is inherently interesting or enjoyable (Mekler et al., 2015).

To design a fun, challenging and engaging experience, gamification in business focuses on understanding the users and not so much on the tools and mechanics of gamification (Dale, 2014). Comprehensive gamification frameworks inspired by psychological theories like the MDE (Mechanics, Dynamics, and Emotions) (Robson et al., 2015) and the Game Elements and Hierarchy (Werbach and Hunter, 2015) enable consistent and efficient use of game designed elements in corporate processes and provide inspiring and motivational experiences for the users.

Outcomes of gamification can be expressed and measured by different types of dimensions or benefits (Patrício et al., 2018). By applying SDT, it has been observed that gamification provides different kinds of benefits to users based on hedonic elements (i.e., the intrinsic motivators), utilitarian and social elements (i.e., the extrinsic motivators).

Therefore, the outcomes of gamification comprehend hedonic elements, such as playfulness, fun and learning experiences, enjoyment and engagement (Cardador et al., 2017; Gatautis et al., 2016; Holbrook et al., 1984). Utilitarian elements encompass

cognitive, functional, creative problem-solving, time to action, usefulness and ease of use (Gatautis et al., 2016; Hamari and Koivisto, 2015; Stock et al., 2015). Besides hedonic and utilitarian, other types of social outcomes can be identified, including recognition, social influence and self-esteem (Hamari and Koivisto, 2015; Harwood and Garry, 2015).

Regarding innovation teams, gamification plays a key role in the coordination of team members and top managers. Several studies suggest using game approaches to support the innovation process and collaboration among teams. Gamification can be applied as a collaborative innovation practice that creates opportunities for supporting collective creativity and helping conflicting parties reach for consensus in the early stage of innovation (Parjanen and Hyypiä, 2019; Patricio et al., 2020). By providing a more engaging atmosphere to collaborate and get to know new people, gamification enables a self-management innovation team approach with a more balanced power distribution that gives equal opportunities to everyone to participate in innovation practices (Parjanen and Hyypiä, 2019; Patricio et al., 2021).

The uniqueness of gamification in relation to other game-like practices in a corporate environment is that it extends the use of games to white-collar tasks, engaging knowledge workers and middle managers in problem-solving (Mollick and Rothbard, 2014; Zichermann and Cunningham, 2011). The relationship between the middle and senior managers also plays an important and complementary role since middle managers can provide resources and support innovative practices, and first-level managers are competent to experiment with innovation projects (Kuratko et al., 2014). Emphasizing the importance of the cognitive dimension in utilitarian outcomes, one of the engines of innovation is the creation of effective and focused teams supported by strong team leadership and communities that guarantee the transfer of tacit knowledge both within the organization and externally (Koen et al., 2014).

If the motivation is concerned with the factors that influence people to behave in specific ways, gamification is a powerful approach to drive team members to the desired behaviors.

### 3. Methodology

#### 3.1. Research method

The following research question was formulated to clarify the role of gamification in innovation teams: How can gamification approaches generate positive outcomes in innovation teams? It was the starting point in the research process, which allowed articulating the whole research design and a better understanding of the relationship between gamification and innovation teams' outcomes (Creswell, 2007). Two concrete objectives were defined as actions intended to answer the research question: i) to apply gamification in innovation teams in a concrete business environment, and ii) to identify the positive outcomes generated by gamification.

The research followed a systematic method through several steps such as continuously collecting and analyzing data, comparing and summarizing data, refining concepts, developing categories and discussing the relationship among them (Strauss and Corbin, 1998). It involved the formation of a theoretical framework using theoretical insights to identify and make sense of the emerging constructs (Gioia et al., 2013).

Based on this research's nature, the method is appropriate to close the gaps identified in the literature and practice of this particular and focused phenomenon, i.e., the lack of empirical research about the outcomes of gamification in innovation teams. But there are other important reasons for choosing this method. First, assessing the performance and effectiveness of innovation teams is complex and involves multiple interrelated factors. Second, this method can extract and summarize the empirical data in real case settings following a bottom-up perspective for theory-building purposes. And finally, it is well-suited to answer "how" research questions targeted at emerging concepts (Gioia et al., 2013).

The single case study presented an exciting opportunity for more focused and unusual research access to a complex phenomenon with significant implications for its process and results (Barratt et al., 2011). Using a single case study was not intended for generalization to a larger population. Instead, it was expected that this case study's context and characteristics would allow other researchers and managers to generalize the findings to their similar contexts (Yin, 2009).

Before conducting this research, university master's students participated in a previous study that addressed concrete innovation challenges with the gamification method and tool applied in this case study. This preceding study, outside this research paper's scope, contributed to the pre-test and reinforced its methodological approach. It made the research protocol more robust by helping to define some of the questions used to assess several aspects of the gamification experience in this case study.

#### 3.2. Research sample

Theoretical sampling was used to select the case study firm, which involved gamification activities in its innovation process involving several teams. The firm was chosen since it exhibits contextually rich data to explore the research question and support the empirical research in real-world settings, i.e., observing a process management practice (Eisenhardt, 1989; Meredith, 1998; Yin, 2009). Therefore, the case study firm was selected for two main reasons: First, the willingness of the firm to adopt gamification approaches, mobilizing teams to participate in a series of different activities like workshops and follow up sessions; Second, the intent of the firm to improve the performance and effectiveness of teams in the context of corporate innovation challenges, which provide an opportunity to examine gamification approaches in teams.

The selected case study firm is a fast-growing facility management firm operating in the areas of catering, cleaning, service vouchers, vending, logistics, and security, among many others, with a sales turnover of €770 million and 31,000 employees. This firm acquired a new business unit (in the area of health and safety in the workplace). It appointed a new board of directors that outlined five strategic challenges for future projects. The innovation manager (IM), responsible for leading and implementing innovation initiatives and processes among the corporate business units, helped this new unit frame and address its priorities and challenges. Soon after the generation of ideas, using design thinking methods and tools like customer journeys and visioning techniques, the innovation manager decided to use a gamified approach for idea development to achieve more robust project plans for implementation and increase engagement of key stakeholders with corporate challenges and projects.

The case study team, composed of 23 knowledge workers and middle managers, including team leaders (TLs) and team members (TMs), has been selected based on their interest in participating, as well as on the different hierarchies (middle managers and their direct staff) and backgrounds (from operations, marketing and sales, finance and IT).

### 3.3. Gamification method and tool

The chosen ideaChef gamified method and tool for innovation fully complies with the requirements of a recognized gamification framework, i.e., “Game Elements and Hierarchy” (Werbach and Hunter, 2015). It is a board game that uses game elements to engage teams in product or service ideas development already used in corporate innovation projects and academia. This tool is designed for up to six members, requiring a minimum of three. It included the needed materials to develop a chosen idea for a particular challenge, including a play board, two sets of question cards, play points and tokens, personal boards and menu cards for each member, customized sticky notes, dice, a marker, and a timer.

This study applied this tool since it provides a gameful, challenging, and engaging ideation experience in more fun, stimulating, and structured teams than the traditional design and sticky-notes approach. When addressing concrete innovation challenges, team members could conduct several tasks based on game mechanics, for instance, discussing and voting different contributions and merging and building on the most consensual aspects of the product or service development process. Complementary support documents and templates were provided to support the gamification experience, such as the team members' challenge descriptions and personal instructions.

### 3.4. Study design

This exploratory study was focused on the idea development stage of a current strategic and innovation project of the selected firm. The board of directors/Challenge Owners (COs) and the IM outlined five strategic challenges for the project: a) customer loyalty (CL); b) value-added offer (VO); c) new solution (product-service system) development (NSD); d) corporate image (CI); and e) business processes (BPs). For each challenge, an interdisciplinary team of four to five members, including the team leader, was designated. Each team generated several ideas with design thinking methods and tools and chose one to develop. The study took place over four months by conducting workshops, follow-up meetings, and semi-structured interviews with top management, i.e., challenge owners, the IM, team leaders and members.

The setup meeting (phase 1) conducted with the challenge owners (the CEO and two other members of the board), the IM and the five-team leaders (one for each of the five teams) served to confirm user needs and chosen ideas.

Besides assisting phase 1, the researcher also participated actively in the idea development (phase 2), running both workshops (the first with 5 teams and the second just with NSD team) as a facilitator and collecting data from follow-up meetings and interviews. Facilitation operates as an enabler that releases a team's creative thinking, encourages informants to “think outside a box”, simplifies the use of the method and tool and provides structure and guidance through the process (Agogué et al., 2015; Schulz et al., 2015).

During the idea development phase, each team developed its chosen idea and drafted a solution with the support of the gamification method and tool. This intervention was conducted during the first gamification workshop in which the five teams presented the proposed solutions and received feedback from the challenge owners. The gamification workshop session lasted three to 4 h with the following schedule and duration: a) Setup and alignment – 30 min; b) Developing the chosen idea – 120 min; c) Preparing the report with a draft solution that allows designing a project plan for the chosen idea – 60 min; and d) Pitch – 30 min.

A second gamification workshop with the same agenda was conducted to fine-tune the solutions of the NSD team. Allowing iteration, at least two rounds, with a quick reflection or discussion before the second round paves the ground for a continuous learning process and feedback loop that will reduce risk and improve success rates in the innovation process (Bogers and Sproedt, 2012; Liedtka, 2015). During this workshop, it was possible to turn the draft into a more robust solution by incorporating additional feedback from the board members, new inputs, and lessons learned from the first workshop. In the last phase (phase 3), board members, the IM and team leaders reviewed and improved the project plans based on the draft solutions (from the second workshop for the NSD team and the first workshop for all the other teams).

Gamification workshops were designed, planned and facilitated by the researcher, contributing to a deeper understanding of the phenomenon and validating the data obtained from the follow-up meetings and interviews (Zomerdijsk and Voss, 2009). Despite facilitating the workshops, the researcher did not influence either the teams' ideas inputs or outputs.



### 3.5. Data collection

The data collection followed a comprehensive research procedure using different instruments in three months. Besides ten individual and team-level interviews with key informants (Table 1), data collection included other data sources, such as site visits, workshops, and meetings observations (gathering photographs and video recordings – 147 photographs and 22 short videos – around 20 min and multiple field notes) along with archival documents (five challenging briefings and five other internal project reports, e.g., strategic plans and several media documentation).

Immediately after the first gamification workshop, informants were asked to provide feedback about their experiences and appreciation of the process using the instruments mentioned above (Table 1). Team-level interviews that lasted between 20 and 30 min were conducted with each team (TL and TM) and the board members (BMs). TL and TM were asked explorative questions about (i) the gamification method and tool; and (ii) the value and dynamics of the innovation project. BMs were asked exploratory questions about: (i) the quality of recipes/solutions presented by the teams; (ii) the type of support for the implementation of the solutions; and (iii) the value and dynamics of the innovation project.

After the second workshop (phase 2), a debriefing questionnaire was undertaken with the NSD team leader and members, followed by a semi-structured individual interview with the NSD team leader (Regional Commercial Director). NSD team members were asked explorative questions about: (i) the level of improvement of the solution achieved in the second workshop; (ii) the workshop facilitation; and (iii) their expectations regarding the implementation of the proposed solution.

Data gathering was concluded with semi-structured individual interviews conducted after the final meeting (phase 3) with the innovation manager (IM) and two other team leaders (VO – Commercial manager and CI – Operational division coordinator). During the individual-level interviews, TLs were asked exploratory questions about: (i) the gamification method and tool; (ii) the discussion and collaboration process; (iii) the insights gathered; and (iv) the results of applying gamification to the innovation project.

All individual-level interviews were based on the research goals and questions that increased the reliability of the findings and conclusions. The goal was to check for the outcomes of the gamification approach on the work activities and trace back the actions observed during the workshop sessions.

The data collection process included other sources of information to triangulate findings, validating the results and providing more insights (Yin, 2009). It was driven by transparency and clarity about the data and research instruments, allowing to replicate data collection from the study's information.

### 3.6. Data analysis

The analytical procedure to integrate all the data from the interviews, follow-up meetings, and observations followed a thematic coding process that helped determine repeated patterns and differences across the entire dataset and describe the core themes (Braun and Clarke, 2006). Initially, first-order themes have been formed based on the mapping of relevant data elements, i.e., answers, behaviors and conclusions perceived by informants. Immediately after, these informant-centric themes were grouped into second-order (theory-centric) themes. Each theme was then refined into aggregate theoretical dimensions (Braun and Clarke, 2006; Gioia et al., 2013). Throughout the entire process, always supported by visual representations of data, it was possible to adjust the research study's direction, which ended only when additional data did not provide new categories or relevant themes (Strauss and Corbin, 1998).

Moreover, some measures were taken to ensure validity and reliability during the research process. Triangulation has been addressed to extend and validate the data collection by using internal project reports and case study firm documents, which allowed for corroborating or contradicting evidence from data collection and findings (Kindström et al., 2013; Yin, 2009).

As mentioned, all gamification workshop sessions have been documented with photographs and video recordings, thereby providing valuable observations of the work in progress. A few minutes of recording from each workshop session have been selected to observe the critical dialogues between informants and the interactions with the game dynamics and, at the same time, to crosscheck the data collected from the follow-up meetings and interviews.

Finally, by cross-checking of facts and impressions and developing a comprehensive coding process, the reliability of the findings and results of the research study was also ensured. Each interview has been voice recorded for further analysis and data transcription validated by the interviewees. Likewise, incorporating an interview protocol and organizing the collected transcripts made the research method replicable (Kindström et al., 2013).

**Table 1**  
Data collection.

Activities	Instrument	Informants
1st Gamification Workshop 5 teams	Debriefing group interview	1 interview with board members (COs) 5 interviews with each team (TL and TM)
2nd Gamification Workshop 1 team (NSD)	Debriefing questionnaire Individual interview	5 written responses from the NSD TL and TM 1 interview with the NSD TL
Final meeting	Individual interview	1 interview with the IM 2 interviews with two other TL

## 4. Findings

This section explains the categories that emerged from data coding. Table 2 in the appendix shows the analytical progression achieved from raw data (informant-centric) to second-order (theory-centric) themes, highlighting the emergent themes that will be addressed in more detail in the discussion section (Gioia et al., 2013).

### 4.1. Hedonic outcomes

The second-order themes of involvement, playfulness, and newness emerged from data that illustrate hedonic outcomes and explain team engagement throughout the innovation process and idea development in particular.

Involvement means to take part, or become involved, in the project. This theme is illustrated by several quotations from the group and individual interviews. It was observed that safeguarding a balanced contribution contributed significantly to the involvement of all participants. Moreover, providing the same space and time to contribute ensures no one imposes their views and dominates the conversation. Feedback is also key since application of the gamified method and tool promotes a positive feedback loop among participants. The incentive to keep up with this game experience and maintain the involvement is high, which is illustrated by the fact that, after the second gamification workshop, all NSD team members expressed their interest and availability to participate in the future implementation of the project. On the same page, the following view from one member of the board demonstrates how this approach supports their organizational goals and innovation culture principles, defined as: “people first, through involvement and collaboration”; “The involvement generated by the project is in line with the cultural change we intended to implement to give greater relevance to the participation of everyone and create commitment with the defined objectives.”

From several statements of informants, it seems the gamification approach (during formal and informal activities) effectively contributed to involving everyone: “I see benefits as regards engagement and get people involved and participating”; “It gets everyone involved because it ensures that they all have the same influence and time to contribute”; and, “the other groups spontaneously gave us ideas during coffee breaks.”

The tool itself was a significant enabler, as recognized by many informants: “It made perfect sense to use a board game”; “By playing, everyone has to participate, but no one felt compelled to participate”; “Regarding the questions and the organization of the game, I thought it was very well-conceived”; “It is interesting to evaluate each member of the group anonymously.”

Playfulness can be explained as the pleasure of using something fun. People are getting tired of the current high-pressure work environment that affects them negatively and are looking for approaches that make them feel more relaxed. Playfulness has been observed and mentioned quite often during the workshop sessions and group and individual interviews. Games can be used to engage people in day-to-day activities that usually require extrinsic incentives. As mentioned by informants: “The fact of being a game provides a more relaxed way to conduct our tasks.” Also, “it is a fun way to do serious things without noticing it.”

Newness has not been one of the topics asked in any of the interviews, but it emerged spontaneously as a theme during the interviews. Newness can be expressed as the enthusiasm and surprise of using a new and different approach. For most the participants, it was the first time they were involved in ideation activities. Regardless of age, gender or background, none of them had been expecting to interact with a game-like approach. The IM is on record as stating: “To innovate is to surprise and I think people have been surprised by the nature of the whole process.” The following statements suggest that the approach was easy and comprehensive: “It was the first time I did a workshop on gamification”; “I think it's a very different approach”; “It is an innovative tool, very simple to use.”

### 4.2. Utilitarian outcomes

Themes that best describe utilitarian outcomes are structured process; timely process; time to act; and creative thinking. Structured and timely processes fit into the cognitive category and are directly related to the acquisition, understanding and organization of knowledge.

The structured process received several comments during group and individual interviews, particularly in relation to the focus on relevant activities and the knowledge required to structure an idea. Data elements suggest this structured process helped participants to align ideas about their particular challenge and project. As mentioned by the NSD team leader, “it allows us to quickly align a set of ideas that are on the table.” The IM also strengthened this argument when he stated, “it provides an easy structure for a group to start working together and thinking in a structured methodological fashion about the idea.” Teams began to share knowledge about corporate challenges and projects in a more explicit and structured manner. The following reference made by board members about the method endorses the value of having employees aligned with the goals: “the method that has been used contributed significantly to the achievement of desired behaviors.” To accomplish this, participants had to learn how to “think differently and create a new structure based on a way of thinking with rules, instead of in a messy manner,” as mentioned the NSD team leader mentioned.

There are also some evidence supporting the view that gamification makes it easier to structure the ideas. As mentioned by one of the TM: “It was important to help us to structure the project, the very idea of the project, that is, to have a clear driver, what we want and what the solution is and which are the processes that we should use.” Other informants confirm this

view: “We were able to generate ideas a little bit differently and to structure them. This approach contributes not only to let people express their ideas but also to other members of the group supporting those ideas and improving them with other contributions.”

It seems gamification has the power to structure and align teams in addressing the innovation challenges. “Without this type of process, we would not reach this set of ideas and this result. The focus is essential, which helps to arrive at something more tangible than the initial idea”.

The timely process theme is the second cognitive outcome that emerged from the data. Rules and time constraints are related to the time frame to perform certain game activities, i.e., if an activity occurs at a suitable time. This constraint is critical to ensure a timely process and has been recognized by informants. The CI team leader mentioned that “time management is very important because we sometimes tend to deviate from the central points and start arguing over how many angels can dance on the head of a pin.” Nevertheless, there are conflicting perspectives about the amount of time needed to perform a core game activity, i.e., to reply to a particular question. The NSD team leader felt the time to complete a particular activity (2 min) had been a bit short. But for the CI team manager, it had been perfect, giving everyone enough time to address the question. All agreed that paying attention to the time limits is an excellent aspect of not running away from what was scheduled. We reach the end of the day with lots of ideas written down and completely exhausted, which signifies that we have been very concentrated and without dispersion. At a given moment, we had the pressure to move faster. Reaching consensus on what idea to follow and how to structure the idea would have been much more time-consuming.

The time to action theme emerged from data when trying to assess the productivity outcomes of gamification. Besides ensuring well-timed activities, as discussed in the timely process theme, in order to increase productivity, it is fundamental that the overall ideation process is accelerated. Time to action is a key driver of productivity, but it has been observed that productivity also has linkages with other core themes like structured and timely processes. In fact, the level of satisfaction with a focus on relevant activities, which is one of the items of a structured process, surpassed the time to convert ideas into projects in both cases. Time-to-action issues have been mentioned by the NSD team leader and by the IM. The nature of the project and the background of the NSD team leader may explain why he paid particular attention to the time to convert ideas into projects. As he mentioned, “I have been involved in other innovation projects using traditional methods of thinking and creating, and they are not comparable to this approach. Gamification shortened deadlines in relation to the normal projects.” The reasons for this achievement are due to the nature of game approaches. Several citations support this view: “If it was not the game, I think the whole process until getting closer to the implementation part would be much more time consuming”. “We were forced to move fast in time”. “If not, maybe we would still be discussing what idea would be taken forward”.

The quotations from the interviews support the idea that thinking about an idea in a deep manner or simply rethinking a particular view of reality leads to greater insights into the issues. As mentioned by the IM, “Gamification encourages the team to ask certain questions that they might otherwise not ask. It forces the team to look at all aspects of the idea and to think about it from a 360° perspective. It also helps to develop the idea and to find its weakest and strongest points as well as reach a well-rounded description of the idea. I believe it helps the whole process of thinking about the idea.” Creative thinking has been particularly well recognized by the NSD team and by the IM since the nature of innovation is very much related to this perspective. The game forces teams to think about aspects of the idea that were not considered otherwise, which is important before starting thinking about the solution. The questions within the same topics force us to rethink what we have in the first response. This will make people think deeply and answer particular questions rather than just answering questions that they already had the answers to.

#### 4.3. Social outcomes

Team building and consensus-building are the themes that better illustrate social outcomes. As observed by the IM, “the gamified method and tool allowed everybody to participate and accelerated the whole team-building process.” Gamification strengthened relationships, increased team spirit, and promoted a better work environment. Without exception, team members considered that gamification at the team level is definitively beneficial. As one TM mentioned: “I think it is good for team building and put people work together, helps to build team spirit. It was easy to work as a team, I do not know if it was also because of the same background we already had about the challenge.”

One of the NSD team members recognized, “one thing is to think alone, group thinking is another, but the most important thing is to reach consensus.” This is particularly critical to managing conflicts among the team. “Whoever works in a team has to adjust; we do not own the truth and must realize that there is another way. We realized that we had to leave aside some more personal questions and work for our company. It was not exactly the idea we had, but once there is a general consensus, we have to go through there.” As one team member mentioned: “the gamification approach should be mandatory for aligning people. The understanding of the company issues, using the gamification approach, becomes deeper and it clarifies where we want to go.”

## 5. Discussion

The findings show that the proposed gamification approach substantially improves team and consensus building, engagement, and management of conflicts in a more structured and timely manner.



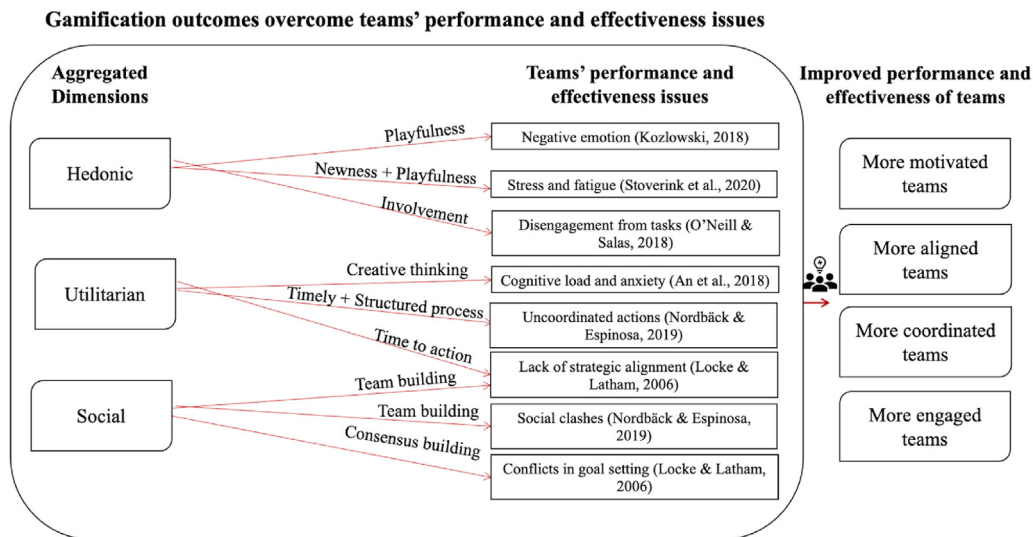


Fig. 1. Conceptual framework.

This section provides meaning to findings by recognizing relevant elements of an emerging theory from data (Fig. 1). The discussion is drawn from existing ideas and theories about teams' performance and effectiveness issues described in the literature review. The purpose is to extract transferable relevant concepts, allowing findings to address a larger audience (Lincoln and Guba, 1985) and generalize from a case study to theory (Bansal and Corley, 2011). This type of approach supports the development of a set of testable theoretical propositions that describe the fundamental relationships between constructs grounded in empirical evidence (Eisenhardt and Graebner, 2007).

The model (Fig. 1) makes it possible to understand how gamification generates multiple positive outcomes (more motivated, aligned, coordinated, and engaged teams) regarding performance and effectiveness issues described in the literature and the study findings.

Besides being more fun, playing a game provides a more relaxed and open environment, which overcomes the negative emotion (Kozlowski, 2018), stress and fatigue (Stoverink et al., 2020), which are critical issues in many teams. Surprising teams with such a new and playful approach also reduce the level of stress among team members. Gamification creates newness and playfulness hedonic outcomes (Fig. 1). As such, the following proposition is formulated:

**Proposition 1.** – By providing a new and playful environment, gamification mitigates the issues of stress fatigue, negative emotion, and task disengagement in innovation teams, making teams more engaged and motivated.

A timely and structured gamified process facilitates coordination (Nordbäck and Espinosa, 2019) since it outlines a clear path for knowledge sharing and teamwork. Gamification rules encourage team members to explicit their views and work in a more structured manner. Time constraints also play a crucial role in teams' coordination by avoiding dispersion and enhancing more focused efforts. Gamification creates timely and structured utilitarian outcomes (Fig. 1). As a result, the following proposition is advanced:

**Proposition 2.** – By providing a more timely and structured process, gamification mitigates the issues related to the lack of coordination in innovation teams, making teams more aligned and coordinated.

Cognitive load and anxiety issues in teams are discussed in theory (An et al., 2020; O'Neill and Salas, 2018) when having intensive knowledge-sharing activities. Creative thinking helps team members get better insights and become less anxious by rethinking their particular views of reality more relaxedly. Gamification creates creative thinking and utilitarian outcomes (Fig. 1). As such, the following proposition is formulated:

**Proposition 3.** – By providing a more creative and relaxed mode, gamification mitigates the issues related to the feeling of anxiety and overburden in innovation teams, making teams more motivated and engaged.

Team building, combined with an accelerated process that forces participants to move fast in time, contributed to promoting stronger ties among team members and reinforcing team members' alignment (Locke and Latham, 2006), which is also identified as a significant difficulty in managing teams. Findings show that team building strengthens relationships and increases team spirit, positively contributing to higher levels of alignment. Moreover, team-building mitigates social conflicts (Nordbäck and Espinosa, 2019) by promoting a better work environment. The conflicts among the team members in goal setting are mentioned in the literature as a significant concern regarding team members' performance and effectiveness (Locke and Latham, 2006). Findings support the idea that consensus building created by gamification helps to overcome these issues. Thanks to the gamified approach, team members are encouraged to adopt learning behaviors, promote knowledge sharing and adjust their views, preventing conflicts

among the team's members when setting challenging goals. Gamification creates a team and consensus-building social outcomes (Fig. 1). As a result, the following proposition is advanced:

**Proposition 4.** – *By providing team and consensus building, gamification mitigates goal setting issues and work environment conflicts in innovation teams, making teams more aligned and engaged.*

## 6. Conclusion

### 6.1. Theoretical contributions

Gamification is proposed to improve the performance and effectiveness of corporate teams, having more aligned, coordinated, motivated, and engaged teams. This topic was extended from the existing literature that discusses psychological and corporate teams' theories, providing potential implications for both theory and practice with evidence of insights into gamification outcomes in innovation teams.

The paper addresses the research objective of examining how gamification can improve teams' performance and effectiveness in corporate innovation challenges. The findings suggest the gamification approach fully involves all teams by creating an open, fun and playful atmosphere appropriate for collaboration and continuous participation in innovation process initiatives. The range of outcomes goes beyond engagement and includes others, such as structure, timely process, creative thinking, and social outcomes, namely, team spirit and consensus-building.

Therefore, gamification holds the potential to support some of the complex tasks teams need to perform throughout the innovation process. Gamification helps teams share knowledge, develop a positive feedback loop, build consensus, drive the desired behaviors, structure ideas, and possible draft solutions to challenges. This type of approach helps to overcome significant difficulties of managing teams, like setting goals, coordinating activities, ensuring the alignment of the organization, and motivating team members.

This study provides significant contributions to innovation management theory, mainly how successfully manage teams in the innovation process. By providing a more creative, structured and engaging approach, gamification can help teams overcome the main difficulties and challenges of managing the innovation process from systemic and social perspectives. The latter is related to goal setting and coordination of tasks, while the former is much more about consensus building, involvement and motivation.

The empirical findings of the case study support a set of propositions derived from the conceptualization of gamification in the context of innovation teams. These propositions advance this field of knowledge, serving as starting points for further studies. Another important direction for future research on innovation management is the potential impact of gamification on improving corporate teams' engagement and success. Since motivating teams to innovate is difficult, gamification could help leaders create incentives to participate and engage employees in longer-term company-wide innovation initiatives.

### 6.2. Managerial implications

Besides contributing to a better understanding of the relationship between gamification and innovation teams' outcomes, this paper provides important implications for the practice with real-world inputs for practitioners seeking to measure gamification outcomes in teams.

First, it offers valuable insights into explaining the types of outcomes teams can accomplish when deploying gamification approaches. Gamification generates hedonic as well as utilitarian and social outcomes of different magnitude and nature. These outcomes were observed with the deployment of the gamified method and tool. The paper provides essential managerial contributions on how, why, and when gamification may improve innovation teams' performance and effectiveness. For example, team managers can use gamification to involve more effectively all team members and make work tasks more enjoyable, boost team motivation, and increase engagement with workplace activities. Moreover, it also provides empirical evidence on how gamification works to achieve hedonic, utilitarian and social outcomes and how these outcomes can be measured in a team environment.

Second, it contributes to a better understanding of teams' dynamics and how gamification can overcome the issues that conduct to a decline in teams' performance and effectiveness. The conceptual framework illustrates multiple positive gamification outcomes, particularly in coordination, alignment, engagement, and motivation.

### 6.3. Limitations and future research

Two limitations associated with this study are worth referring. First, the context-specific nature is its major limitation. It would be interesting to examine this phenomenon in other contexts (for instance, innovation teams in industrial SMEs) to enrich the findings and contributions to theory and practice. A second limitation is an exclusive focus on the early stage of the innovation process. A suggestion for future research is to examine the back-end innovation process in a more linear stage-gate thinking and commercialization, which entails a different type of culture and team management.

Although efforts were employed to ensure the findings' trustfulness, there have been some constraints and limitations when planning and conducting the interviews. The main difficulties were scheduling the highly participated workshops,

which involved time constraints of teams from different departments and hierarchical levels. Nevertheless, this practical dimension of the case study provides the validation necessary to produce a high-quality theory about how teams can apply gamification to improve their performance and effectiveness.

Integrating gamification in innovation teams is a promising research field. In terms of new directions, a significant opportunity for future studies relates to the deployment of gamification approaches throughout the whole innovation process. It makes sense to investigate how gamification approaches can be applied to the subsequent stages, i.e., new product development and commercialization. Findings also lead to potential research in other areas of innovation like the co-creation of value in multidisciplinary teams with customers by using gamification to incorporate their inputs in the concept design of new products and services.

Further research could also explore existing results in other contexts and business sectors. It would be interesting to study idea development through gamification in industrial firms with organizational silos that are not commonly using teams or even in closed-minded corporate cultures where games and play are still considered diversions from work tasks.

To conclude, the paper provides some pieces of evidence supporting the view that teams are eager to adopt new and more engaging approaches to participate and collaborate throughout the innovation process. The gamification approach fully involves all team members by creating an open, fun and playful atmosphere appropriate for collaboration and continuous participation in innovation process initiatives.

### Declaration of competing interest

The authors declaim no conflict of interest.

### Appendix

**Table 2**  
Coding tree

First Order (Informant-Centric) code	Second-Order Theme	Aggregated Dimension
<ul style="list-style-type: none"> <li>• Creating space for everyone's participation is very important to allow the participation of all.</li> <li>• I am delighted with the results so far in terms of the engagement and motivation factors that gamification provides.</li> <li>• I felt a sense of commitment; it turned out to involve people 100%.</li> <li>• All contribute and build on top of others to come up with a better idea in the end.</li> <li>• It is quite a different way of approaching a challenge and a fun way to find solutions.</li> <li>• Very interesting method, through a game that is something interactive and more dynamic.</li> <li>• This approach surprised and engaged the team members in a way that they didn't expect.</li> <li>• It is a unique approach and original because we are thinking outside the box but focused on ending up with a concrete idea at the end.</li> </ul>	Involvement	Hedonic
<ul style="list-style-type: none"> <li>• It is very well thought out and helped significantly to create an idea of what we wanted for our project.</li> <li>• The methodology helped the process unfold and things flowed naturally with logic.</li> <li>• No vague things but process-driven activities that we know when the game is going to end, then makes things more structured, when working with boundaries, you have to be objective.</li> <li>• The fact that each moment is timed is important because the idea may not be fully developed but is already registered, then the ideas could be developed with more time.</li> <li>• It had been a huge intellectual effort from the point of view of thinking with limited time.</li> <li>• Without gamification, the process would take much more time.</li> <li>• Games, by their nature, have an end either after a certain amount of time or when a particular objective is reached, so providing that kind of structure gamification can help to speed up the whole process.</li> <li>• As playing the game, people get surprised by a question that comes up because they hadn't gotten the answer before, they hadn't thought about that particular aspect of the idea, or they are having trouble relating that question to the idea that they are evaluating.</li> </ul>	Playfulness Newness	
<ul style="list-style-type: none"> <li>• It was a great intellectual effort from the point of view of thinking differently about all the questions. We thought that thinking outside the box just had a different idea from another angle, but that's not enough.</li> <li>• We have all pulled in the same direction and with the same group spirit.</li> <li>• The atmosphere created by the game was fantastic.</li> <li>• I felt from my colleagues a sense of commitment in relation to the project.</li> <li>• We ended up with a healthy way to get rid of the individual ideas we brought and follow those that the team had considered having more potential.</li> <li>• From what I observed, it can also lead to conflict resolution, people get together, discuss their opinions and get to a conclusion and consensus.</li> </ul>	Structured process Timely process Time to action Creative thinking Team building	Utilitarian Social
	Consensus building	

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