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REVIEW

Gamification and open innovation in organizations: a systematic review of the literature

Gamificación e innovación abierta en organizaciones: una revisión sistematizada de literatura

Sergio Salguero[1], Nicolás Novaira[1]

[1]Universidad Siglo 21. Córdoba, Argentina.

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Corresponding Author: Nicolás Novaira

ABSTRACT

The study examined the link between gamification and open innovation in organizations as a training strategy to promote participation, ideation, and creativity. Despite growing interest, there is limited research integrating both concepts in organizational settings. A systematic review was conducted following the ReSiste-CHS framework, combining bibliometric and thematic analysis. Databases such as Scopus, EBSCO, Google Scholar, and Taylor and Francis were used. The bibliometric analysis revealed four thematic clusters: innovation management, co-creation, crowdsourcing, and applied technologies. Gamification occupied a central position, acting as an interface between different innovation dynamics. However, an instrumental approach predominated, with little inclusion of pedagogical or critical frameworks. Gamification was found to contribute to the promotion of open innovation, especially in the early stages. However, beyond its motivational potential, its impact depends on strategic design and integration with pedagogical theories. The research suggested that future research should incorporate epistemological approaches to consolidate its educational value in organizational environments.

Keywords: Gamification; Systematic Review; Organizations; Creativity; Open Innovation.

RESUMEN

El estudio examinó el vínculo entre la gamificación y la innovación abierta en organizaciones, como estrategia formativa para promover la participación, la ideación y la creatividad. A pesar del interés creciente, existe una limitada investigación que integre ambos conceptos en entornos organizacionales. Se realizó una revisión sistematizada siguiendo el marco ReSiste-CHS, combinando análisis bibliométrico y temático. Se utilizaron bases de datos como Scopus, EBSCO, Google Scholar y Taylor and Francis. El análisis bibliométrico reveló cuatro clusters temáticos: gestión de innovación, co-creación, crowdsourcing y tecnologías aplicadas. La gamificación ocupó una posición central, actuando como interfaz entre distintas dinámicas de innovación. Sin embargo, predominó un enfoque instrumental, con escasa inclusión de marcos pedagógicos o críticos. Se observó que la gamificación contribuyó al impulso de la innovación abierta especialmente en fases tempranas. Sin embargo, más allá de su potencial motivacional, su impacto depende de un diseño estratégico y de su integración con teorías pedagógicas. La investigación sugirió en futuras investigaciones incorporar enfoques epistemológicos para consolidar su valor formativo en entornos organizacionales.

Palabras clave: Gamificación; Revisión Sistemática; Organizaciones; Creatividad; Innovación Abierta.

INTRODUCTION

There is consensus in defining gamification as the set of techniques used in non-playful settings. These techniques are commonly used in higher education to increase student motivation and engagement in a learning task.[1,2] The act of gamifying involves introducing game elements and experiences into the design of learning processes in any field of study and organizational context, aimed not only at learning but also at developing certain cross-cutting skills and attitudes such as collaboration, self-regulation of learning, and creativity. In this sense, it shows a certain level of effectiveness in capitalizing on individuals' motivation, inducing changes in attitudes and behaviors, as well as fostering innovation, creativity, participation, and teamwork. However, it is important to note that research on the implementation of this methodology in open innovation initiatives is still limited. Its application is mainly restricted to contexts of ideation, *crowdsourcing*, or co-creation, encouraging the participation of customers, consumers, or members of the university academic community.

On the other hand, the progressive evolution of traditional linear innovation models towards open and complex integrated innovation systems (with diverse actors and technologies) enables the circulation of knowledge and resource flows to generate economic value.[3] This flow is analyzed under the term open innovation,[4] defined as "a distributed innovation process based on knowledge flows deliberately managed across organizational boundaries, using monetary and non-monetary mechanisms in accordance with the organization's business model."[5,6,7,8,9,10,11] In these environments, supported by collective wisdom and collaboration, a synergy of knowledge, both internal and external, is achieved, which allows innovation to be enhanced through strategic projects with a significant impact in areas of research, development, and innovation.

Therefore, to address this research, the three most important uses of gamification are recognized: influencing behavior, promoting skill development, and enhancing the ability to create and innovate.[6,12,13,14,15,16] To this end, we seek to examine the role that gamification can play as a training strategy within an open innovation proposal in organizations, based on a systematic review of scientific literature. The review is organized around two guiding questions: How does gamification as a training strategy contribute to open innovation processes in organizations? (main question). What are the main definitions, theoretical approaches, and methodological perspectives present in the literature on gamification in the context of open innovation? (mapping question). These questions were formulated following the PICo model, commonly used in systematic reviews in the social sciences:

- P (Population): organizations involved in open innovation processes.
- I (Intervention): use of gamification strategies as training, participatory, or motivational devices.
- Co (Context): organizational and academic environments where open innovation practices are promoted, especially in the ideation, co-creation, or crowdsourcing stages.

To achieve this objective, we first constructed an interpretation process based on a bibliometric analysis and content analysis of a sample of primary sources.

METHOD

The term *open innovation* is not included in the DeCS thesaurus; however, it is incorporated into the conceptual framework of this study due to its theoretical relevance.

From a methodological point of view, the ReSiste-CHS framework was chosen for the systematic reviews of the social science literature.

This protocol was not registered in public databases such as PROSPERO, as it is a systematic review of non-clinical literature, focused on studies in the organizational and educational fields. The protocol followed is organized into four phases: search, evaluation, analysis, and synthesis, each with specific objectives that structure the systematic treatment of the documents.

The search phase considers the concept of an optimal database group constructed by combining general or multidisciplinary databases and specific databases. Thus, the Scopus, Taylor and Francis Online, EBSCO, and Google Scholar databases were combined.

The scientific evaluation gives preference to Scopus (and WOS) as reference systems. Here, it was considered appropriate to address criticism of the Anglo-Saxon bias of these systems and to use another search engine such as Google Scholar to balance the overrepresentation of Scopus and the problems this may cause in the social sciences and humanities.

The search equations (SE) used were:

- Scopus: TITLE-ABS-KEY (gamif* AND "open innovation")
- EBSCO: gamification AND "open innovation"
- Google Scholar: ("gamification" AND "learning strategy" AND "open innovation" AND "organizations").
- Taylor and Francis: "gamification" AND "open innovation."

During the evaluation phase, eligibility criteria were established for the selection of documents:

Type of document

- Articles published in peer-reviewed academic journals.
- Indexed conference papers.
- Chapters from academic books.
- Complete books (provided that they make a substantial contribution to the analysis of gamification in the context of open innovation).

Exclusion criteria

- Technical reports.
- Blog posts.
- Unpublished theses.
- Non-peer-reviewed gray literature.

Language criteria

- Publications in Spanish, English, and Portuguese.

Time frame

- No initial limit was established.
- Works published up to March 2025 were included.

Thematic focus

- Explicit approach to the link between gamification and open innovation in organizational contexts.

The analysis strategy focused on exploring and describing relevant debates or thematic areas in the research output. The first search integrated the keywords into each database. In a second stage, the inclusion and exclusion criteria were applied, and only those that met the linguistic criteria were selected. In the third stage of the search, documents that did not focus on the topic of this review were eliminated, discarding those that did not mention the terms *gamification* and *open innovation* in the abstracts (table 1). Two reviewers selected the studies independently. Discrepancies were resolved by consensus.

Table 1. Evaluation phase and search stages

First								**Second**		**Third**			
Articles with keywords				Articles delimited by inclusion and exclusion criteria				Duplicates		Reports not retrieved		Deleted because they do not belong to the subject area	
Scopus	EBSCO	Google Scholar	Taylor & Francis	Scopus	EBSCO	Google Scholar	Taylor & Francis						
38	7	125	40	38	7	114	40	10		6		164	
Subtotal			210		Subtotal		199	Subtotal	189	Subtotal	183	Total	19 (+6)

In this systematic review, 210 records were initially identified in academic databases. Applying thematic criteria to titles and abstracts, 11 records were excluded, leaving 199 documents. After removing 10 duplicates, 189 records were evaluated, of which 6 could not be retrieved. A total of 183 documents were analyzed in depth, and 25 that met the criteria were selected. Due to access restrictions, only 19 were analyzed in full.

No risk of bias assessment was performed given the exploratory and descriptive nature of this systematic review. Literature mapping was performed using VOSviewer software as a complementary strategy for the systematic review, and bibliometric analysis was combined with a narrative thematic analysis.

The mapping was based on a total of 25 documents. Of these, 19 have complete metadata (title, abstract, keywords, and references), while only 6 have title, abstract, and keywords. The inclusion of the latter seeks to broaden the thematic coverage of the analysis, mainly in terms of concepts, although it limits the depth of the analysis of citations and co-authorship. This limitation is taken into account for the correct interpretation of the results and is disclosed to ensure transparency in the research.

With the document base established, the results were exported in RIS format for analysis with the aforementioned software. The complete list of included studies is available in the following open repository.[10]

In order to adequately address the two guiding questions of the study, two different thresholds for the

minimum frequency of keyword occurrence were applied (table 2), thus generating two complementary bibliometric maps.

The option to create a main map based on bibliographic data was selected to produce a keyword co-occurrence map, which is shown in figure 1.

Table 2. Criteria for choosing the co-occurrence threshold in VOSviewer

Co-occurrence threshold	Purpose	Justification
2	Main map	Allows the identification of the most frequent and robust terms, as well as consolidated thematic clusters. Provides answers to questions about dominant approaches, definitions, and methodological perspectives in the literature.
1	Secondary, complementary, exploratory map	Enables the inclusion of less frequent but potentially relevant terms that could reveal emerging relationships. This answers the question of how gamification contributes to open innovation but from a forward-looking perspective.

For experimental purposes and in order to enrich the analysis and academic writing, the ChatGPT language model (OpenAI, version GPT-4o) was used at some stages of the process. It was used as a support for the development of search equations, synthesis, partial drafts, and stylistic improvements. In line with the recommendations of WAME, we declare that its use does not replace human authorship or intellectual responsibility for the content, and that all analytical and editorial decisions were made by the authors.

RESULTS

Figure 1 shows a bibliometric map providing a graphical visualization of the keywords in labeled nodes and thematic groupings, or clusters.

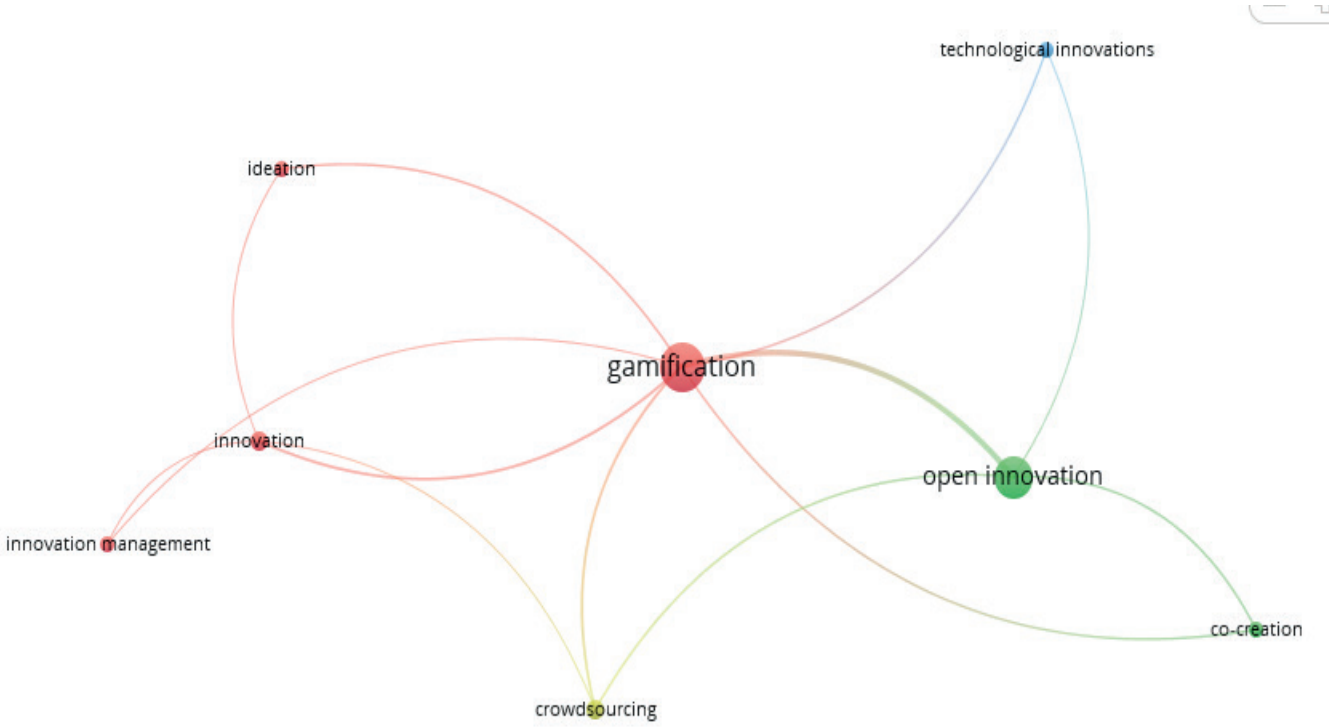

Figure 1. Bibliometric map with threshold at 2

The central node is occupied by gamification. Open innovation occupies the intermediate level of centrality as a bridge node between others. The peripheral nodes on the map indicate less influence or less developed areas of research or emerging topics.

The map also shows groupings of similar nodes, known as clusters. Four thematic groupings appear, reflecting how gamification is being addressed in the context of open innovation.

Red cluster: innovation management and ideation, explores gamification as a strategy to foster idea generation and the management of innovative processes within organizations (initial stages).

Green cluster: collaborative and open models, shows open innovation approaches that promote co-creation with external actors, using gamification as a tool to facilitate collaboration.

Yellow cluster: collective participation, addresses the use of participatory platforms and crowdsourcing techniques enhanced by playful dynamics to solve problems or generate innovative proposals.

Blue cluster: technological environments as a support for gamified innovation.

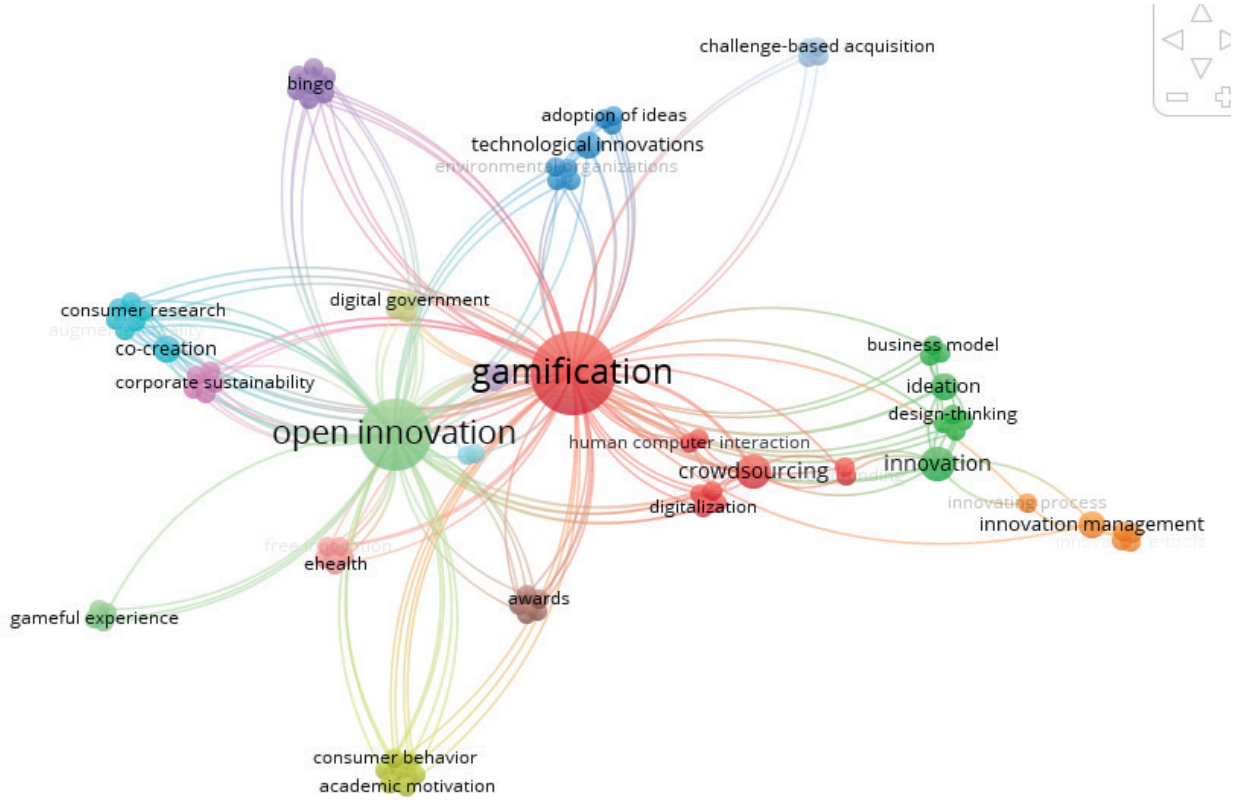

Figure 2. Bibliometric map with threshold at 1

Based on the analysis carried out, it can be inferred that the term *gamification* acts as an articulating interface that enables new ways of experiencing and implementing innovation. Its central position on the map and the density of connections reflect its cross-cutting role between different approaches, actors, and applications. Also noteworthy are the terms *co-creation, crowdsourcing, and innovation,* which, although not the most frequent, have a high link strength (*Total Link Strength)*: *co-creation* (15), *crowdsourcing* (14), and *innovation* (14), suggesting relevance as mediating nodes.

The bibliometric analysis with a low threshold (1) revealed a diverse thematic ecosystem around gamification, with *clusters* linked to innovation management, organizational openness, user experience, and learning, as well as emerging subgroups focused on technology and data. However, there are notable gaps in the presence of pedagogical or critical theoretical frameworks.

DISCUSSION

In principle, we affirm that there is growing interest in the research and application of gamification in the context of open innovation and idea communities.[1,8] Gamification and open innovation are mainly linked in the early stages of the innovation process, supported by the use of digital technologies and platforms to promote collective idea generation, expand participation, and reduce barriers to organizational change and the implementation of innovation models. However, there is a risk of assuming that a higher level of gamified participation is always beneficial, without adequately assessing its impact and real effectiveness in these processes.

Gamification

Currently, these experiences are manifested through the incorporation of game elements for recreational purposes in tasks and contexts not traditionally associated with gaming[11] and are considered a method of intervention in practice-based innovation activities[12] and to accelerate the flow of innovation.[13]

Open innovation

This is based on the active participation of external actors, primarily focused on the early stages of

the innovation process, with a combination of input and output knowledge flows: fuzzy front end,[11] crowdsourcing,[14,15,16] coupled innovation.[17]

Gamification as an application to the innovation process

This can be seen in the idea generation stage (ideation) through crowdsourcing platforms,[2] idea contests,[18,19,20,21,22] facilitating physical and digital processes,[19] seeking to improve creativity and co-creation of knowledge through the use of narrative or dramatic techniques that strengthen the exchange of ideas and experiences,[12] role-playing combined with experience helps to imagine the future and generate new ideas. In addition to its instrumental use in generating and collecting ideas, gamification can also be applied in later stages of the innovation process, such as selecting the best proposals, implementing them, or promoting them. In this way, it can become an effective tool for evaluating performance within an organizational innovation system. It can also be applied at other stages, such as "identifying requirements, exploring design concepts and investigating their feasibility, or building and testing experimental prototypes."[19] Other research links gamification to the three stages of organizational change necessary to implement open innovation (unfreezing, change, institutionalization), with the last stage requiring further research to determine its results.[2]

Elements of gamification and impact

Among the most commonly used components are points, badges, leaderboards, challenges, narratives, virtual goods, levels, rankings, and rewards.[17,19,20] Point systems, both for performance and social evaluation (votes from other participants), stand out for their ability to increase engagement, as do virtual rewards, which can work similarly to financial incentives.[11] Challenges encourage competition between teams and structure tasks collaboratively, while other elements such as random cards or mixed teams add dynamism and diversity to the gaming experience.[12] Although some critical works on gamification do so in the sense of risks such as reducing gamification to scoring, abuse of rewards, deception to change behavior, or even becoming a surveillance tool: "When manipulative factors dominate the discourse, disguised behind the buzzwords of the latest business trends from investment consultants, the genuine benefits of gamification may be overlooked."[19]

Some elements of gamification (especially those aimed at extrinsic motivation, such as points or badges) should not predominate in gamification approaches applied to open innovation processes. Some dynamics such as collaboration are more suitable for "abandoning habitual thinking" as well as "the basic components of games, such as scenario techniques, role-playing, creative (obstacle) game rules, and progression," reserving extrinsic motivators only as support.

Effects and limitations of gamification

Gamification appears to be a promising strategy for fostering or driving open innovation and solving problems,[18,21,22] whether to motivate diverse participants, stimulate idea generation, overcome organizational inertia, or facilitate collaboration. By replacing traditional routines with game rules, it can stimulate participation beyond innovation teams, which is key to attracting external collaborators[13] allowing it to act as a catalyst and overcome cultural barriers, such as the *Not Shared Here* syndrome.[2] On ideation platforms, gamified elements can have a positive impact on the number of contributions and the flow of ideas within and outside organizations.[23] However there are limitations. The use of gamification does not in itself guarantee success in value creation processes.[12] Increased quantitative performance does not always translate into higher quality or intrinsic motivation, and there are risks associated with the use of external rewards that can reduce genuine interest or distort participant behavior.[2,11] In addition, some elements of gamification can be counterproductive if they are not adapted to the organizational context or the characteristics of the participants.[19] A possible attention bias may divert the participant's activity from the main objective if different behaviors are rewarded.[11] Consequently, beyond its potential to drive ideation and participation in open innovation processes, its application depends on a planned design, in line with the strategic objectives and culture of each organization.[2]

CONCLUSIONS

The mapping and analysis of sources detected some gaps in terms of pedagogical or critical theoretical frameworks. Gamification appears to be reduced to a motivational technique, a playful stimulus, rather than a strategic and structuring approach to broader and more complex dynamics within organizations. Most of the sources consulted focus on instrumental approaches applied to improving innovation processes, technology management, and research methodologies. Concepts related to teaching and learning, pedagogical theories, or instructional design models appear only tangentially, without in-depth development. The pedagogical frameworks that could emerge to analyze the design and implementation of gamification in open innovation processes are only briefly mentioned in references to organizational learning and knowledge management.

It can be said that studies on gamification and open innovation do not present an epistemological

problematization. Although uncertainty in the initial stages of innovation is recognized and psychological theories are used to explain behaviors (intrinsic and extrinsic motivation), these approaches respond to practical and functional ends, without questioning how knowledge is constructed or validated in these contexts. The proposed models guide action and applied research but do not formulate a critical reflection on the epistemological bases of the knowledge that is brought into play.

Another aspect to consider in terms of an instrumental approach is the express need to plan a gamification process for open innovation, taking into account the different actors and the organizational culture. This point is closely related to what Gimenez-Fernandez et al.[2] mention, namely that the impact of gamification in the institutionalization phase still requires further research.

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CONFLICT OF INTEREST

The authors declare that there is no conflict of interest.

AUTHORSHIP CONTRIBUTION

Conceptualization: Sergio Salguero, Nicolás Novaira.
Data curation: Sergio Salguero, Nicolás Novaira.
Formal analysis: Sergio Salguero, Nicolás Novaira.
Methodology: Sergio Salguero, Nicolás Novaira.
Validation: Sergio Salguero, Nicolás Novaira.
Writing – original draft: Sergio Salguero, Nicolás Novaira.
Writing – review and editing: Sergio Salguero, Nicolás Novaira.