

Continuous learning at work: the power of gamification

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Abstract

Purpose – This literature review explores the potential of gamification in workplace learning beyond formal training. The study also highlights research gaps and opportunities for scholars to develop new theories and methodologies to enhance the understanding and application of gamification in workplace learning. It provides guidance for managers to use gamification to enhance learning and engagement. Ultimately, this review presents gamification as a promising field of study to increase individual and organizational performance.

Design/methodology/approach – Literature review of 6625 papers in the timeframe 1990–2020, with an update to include papers published in 2023.

Findings – This article examines the impact of gamification beyond formal learning and its potential to enhance employee productivity and well-being in the workplace. While there has been extensive research on gamification in formal learning contexts, little is known about its impact on informal learning. The study argues that the context of gamification is crucial to extending its effects and discusses the role, antecedents and consequences of game design elements in the workplace. The article also explores how the learning context relates to employee learning during work. Further research is necessary to investigate the impact of individual characteristics on work experience and performance.

Research limitations/implications – Intended contribution of the present study is the development of a theoretical framework exploring the benefits of gamification in a work context.

Practical implications – For practicing managers, this paper shows how to use gamification to increase workplace learning and employee engagement, not just in the context of formal learning—as some companies already do today—but also systematically, in the context of informal learning.

Originality/value – This study explores the impact of gamification on informal workplace learning and emphasizes the significance of the context of gamification in extending its effects to improve individual and organizational performance.

Keywords Workplace learning, Gamification, Employee performance, Employee engagement, Literature review

Paper type Original article

1. Introduction

Gamification refers to the use of game-like elements in non-game settings (Deterding *et al.*, 2011), typically in the workplace, to enhance employee productivity, organizational productivity and employee well-being (Oprescu *et al.*, 2014). While gamification has been extensively studied in formal learning contexts, little is known about its impact on informal learning, where employees often learn more efficiently and effectively (Billett, 2004; Froehlich *et al.*, 2014; Guile, 2019; Muzam *et al.*, 2023).

Despite the growing interest in gamification research, the literature is fragmented (Hamari *et al.*, 2014; Manuti *et al.*, 2015; Ferreira *et al.*, 2017; Koivisto and Hamari, 2019). This article aims to explore, via an integrative literature review, the relationship between the context of gamification and its long-term effects. This study posits that the contextual factors



of gamification play a crucial role in extending its effects, potentially surpassing the impact of any individual game element. Drawing upon self-determination theory (Deci and Ryan, 2008; Spraggon and Bodolica, 2017), the article expands the current research literature on gamification by examining the role, antecedents and consequences of game design elements in the workplace. It also discusses how the learning context relates to employee learning during work (Kyndt *et al.*, 2009; Choi and Jacobs, 2011; Bakhanova *et al.*, 2020; Spanellis *et al.*, 2020).

Traditionally, work and play are opposites, but gamification blurs the line by turning work processes into game-like experiences. Although successful in formal learning contexts (Almeida and Simoes, 2019), gamification typically shows a short-term “novelty effect” where positive results dissipate quickly (Hamari *et al.*, 2014). Research exploring causal relations in the context of gamification is, in any event scarce (Nikolova *et al.*, 2016; Koivisto and Hamari, 2019). In management practice, gamification is under-exploited by organizations (Amenduni *et al.*, 2022).

In sum: The intended contribution of this paper is to enhance our comprehension of gamification by concentrating on its contextual factors and its capacity to sustain effects over an extended period. Furthermore, this study endeavors to enrich the workplace learning literature by examining the interplay between the learning environment and employees’ on-the-job learning. We also provide directions for future research.

2. Method

Any attempt at merging workplace learning and gamification on a purely theoretical level has to strive to achieve a holistic vision of both topics. Thus, the literature review in this paper is integrative (Snyder, 2019, p. 335), to “assess, synthesize and critique the literature on a research topic in a way that enables new theoretical frameworks and perspectives to emerge”. As the combination of workplace learning and gamification is a newly emerging topic in the literature, this paper attempts to create an initial theoretical model following this literature review.

Employing the method pursued in the research for the literature review, we initially follow a four-step approach also used by Keding (2020), reducing the number of papers considered through subsequent criteria to ensure their quality for the literature review’s structure. After that, we implement a fifth step: as Snyder (2019, p. 336) noted, a “creative” collection of data is required to combine perspectives and insights from vastly different fields such as workplace learning and gamification. As the last step, we update the theories and concepts that emerged in the original literature review considering only the 400 most cited papers in the 2021–September 2023 period.

Step 1 of the selection process includes choosing the databases to search and the string queries to use. Because of the initial high number of results, we limited the research to Scopus, which yielded 6,625 matches in either the title, abstract or keywords for the three queries defined in Table 1. At first, we sought to understand the current literature involving both fields, finding only three papers that explicitly focused on both workplace learning and gamification. Next, we query for each subject; because of the variety of fields in which gamification appears, the query strings include (“Learning” OR “Education”) to ensure that results were relevant to the present topic.

Step 2 introduces the basic criteria for consideration: we included only papers that have been peer-reviewed, have been written in English and have been published between 1990 and October 2020. These criteria reduced the total number of matches to 3,351, half the starting amount; at this point, there were no results from the first query.

Step 3 introduces another criterion: quality assurance. To ensure the quality of articles considered, we choose only those published in a journal present in the ranking list VHB-

| | | |
|---|--|--|
| Step 1 | <i>Keywords</i> “Workplace learning” and “Gamification” “Workplace learning” “Gamification” and (“learning” OR “education”) | <i>Database</i> Scopus |
| Step 2 | <i>Source type</i> Peer-reviewed academic papers | <i>Language</i> English <i>Period</i> 1990–October 2020 |
| Step 3 | | Remaining total matches: 6625 <i>Quality assurance</i> VHB-JOURQUAL 3 Remaining total matches: 3351 |
| Step 4 | | <i>Content Screening</i> Screening of title and abstract Remaining total matches: 31 |
| Step 5 | <i>In-depth analysis</i> Read the remaining articles in their entirety Scansion of references | <i>Data synthesis</i> Concept-centric approach <i>Concept expansion</i> Multiple searches relevant to identified concepts |
| Step 6 | Replicating steps 1, 2, and 4 while considering the 400 highest cited results for each query in the period 2021–2023 | Total matches: 54 <i>Update</i> Final matches: 78 |
| Source(s): Authors’ own work following Keding (2020) | | |

Table 1.
Selection process for
the literature review

JOURQUAL 3 and ranked from A+ to C. Despite the high number of qualifying journals, only 117 articles satisfied this criterion, mostly because some journals that are quite common in the article list are missing from the ranking list, such as the “*Journal of Workplace Learning*” and “*Human Resources Development Quarterly*”.

In Step 4, each paper has to pass a manual selection, in which the title and the abstract would be the metrics used for the paper’s inclusion in the last step. In particular, those papers would need to be relevant to the theory of either workplace learning or gamification applied to adult education. Upon completing this step, we found only 31 papers were potentially useful for the literature review. Still, the remaining sample of papers needed to be filtered further in the following step.

The fifth step introduced the last criteria along with the actions needed to construct the final list of references: in-depth analysis, data synthesis and concept expansion. For the in-depth analysis phase, we fully read the remaining 31 articles to evaluate how they were contributing to the theory of workplace learning and gamification; after that, we screened the respective references based mostly on the title and, for those that were more promising, the abstract. This activity resulted in four articles remaining after fully reading them; by scanning the references of all articles of Step 4, we selected and fully read 15 papers to ensure that they could be used as the foundation of the literature review, for a total of 19 papers after this phase. For comparison, at the end of the selection process, [Keding \(2020\)](#) had a sample of 58 articles for his review: it wasn’t possible to build a comprehensive literature review with the number of papers that survived the screening process. Therefore, in the data synthesis phase, we extrapolated the topic of each paper and grouped those through a concept-centric approach. In doing so, we identified eight categories that gave structure to the literature review: we dedicated one sub-chapter to each category (see [Appendix](#)). Since the final sample of texts was too small to allow the creation of a literature review that could serve its purpose as the complete

theoretical premise of this paper, we repurposed them as its foundation. At this point, we expanded each concept properly: starting from the 19 papers selected, we made multiple searches based on the evaluation of these key sources, each relevant to the topics identified before, to present them in a synthesized and effective manner. Given the novelty of gamification and the high number of papers published in conference proceedings (Koivisto and Hamari, 2019), it is no surprise that only 10 articles out of 54 have been published in a journal rated by VHB 3. Of these 54 references, the in-depth analysis yielded 19 results; the other 35 have been included to expand the concepts identified in the data synthesis.

As our last step, due to the progress made in both fields between the initial literature review (cut-off date of 2020) and the present moment, we decided to include 24 papers published between 2021 and September 2023. This last step aims to adjourn the topics included in the literature review with the most recent findings. For this purpose, for each query we repeated steps 1 and 2 limiting ourselves to the 2021–2023 timeframe, ordering the results with the “Cited by (highest)” criteria, and screening the content of the first 400 papers following the criteria established in step 4. All papers introduced in this last step will be recognizable by their publication year. The “Workplace learning” AND “Gamification” query yielded two papers, which we both selected. The “Workplace learning” query returned 417 articles, and 12 articles have been included in the literature review section. Finally, the “Gamification” AND (Learning OR Education) query returned 1554 articles, with 10 becoming part of the literature review. These papers have been either included in the relevant category or the last part of the literature review, dedicated to the most recent advances in the research of both fields.

Ultimately, an unconventional collection of sources is normal and expected in an integrative review because it allows new perspectives on different topics to emerge (Snyder, 2019). Therefore, we prioritized the creation of a literature review that could support and enhance the second part of this paper, which describes a theoretical model capable of involving each worker and the working environment itself, complete with potential benefits and obstacles to its realization.

3. Literature review

3.1 Definition attempts of workplace learning

In the 1990s, researchers began to challenge the idea of schools and universities as the only places where it was possible to learn, starting the studies in the workplace learning field. Lave and Wenger's (1991) book on situated learning created a research topic still relevant today, providing a concept widely used in the literature: “Communities of Practice”. This term refers to the active participation in social practices that creates a sense of belonging within a community, where a common interest in a certain topic or area acts as the nucleus and reason for the community of practice's existence. Later studies built on this definition: Eraut (2000) proposed a model to describe how communities of practice grow and sustain themselves through prior experience and knowledge of the individual, combined with the social dimension in which the community of practice is embedded. Guile (2019) went further, using this concept to challenge the traditional assumption that learning at work is radically different from learning in the classroom.

The scope of this definition allowed its use in many disciplines, such as sociology, cognitive science, education, human resource development and knowledge management. This variety gave birth to various interpretations of the definition of workplace learning, based on the associated purposes or the sources of the learning experience (Manuti *et al.*, 2015). Many scholars tried to further outline the concept of workplace learning: among them, Stern and Sommerlad (1999) proposed to focus on how much “learning” and “work” were

separated, while others instead chose to describe the learning processes and to define workplace learning through them: formal, informal and accidental.

3.2 Framing workplace learning: formal and informal

Formal learning has been defined as any form of structured learning that takes place “off the job” and outside the working environment, such as in classroom-based education settings (Marsick and Watkins, 2001). In other words, all activities performed by an individual that have as their objective the acquisition of knowledge, skills or awareness in a specific area are considered formal learning, especially in a context crafted for this purpose. Such learning is also referred to as “training” because of its characteristics: an organized learning event, a prescribed learning framework, the presence of a designated teacher and the qualification awarded for its successful completion (Eraut, 2000).

Informal learning is often defined as a complement to formal learning: whatever activity cannot be classified as formal will be informal, including non-formal or accidental learning (Choi and Jacobs, 2011). This kind of learning happens serendipitously, on the job, and employees are usually unaware of the process. The most common methods include coaching, mentoring, self-directed learning and networking (Kyndt et al., 2009), which received much more attention than formal learning. Empirical studies proved how constant informal learning activities helped employees increase their work-related competencies much more than formal learning (Eraut, 2011).

Researchers gave special attention to learning approaches (Berings et al., 2008) as the means through which to understand what aspects of informal learning should be emphasized. Berings et al. (2008) adopted Biggs’s (1979) definitions of deep, surface-rational and surface-disorganized learning. Those who practice a *deep learning* approach are intrinsically interested in a topic, forging new links between ideas and concepts, new and previous knowledge. Individuals who prefer a *surface-rational learning* approach strive to achieve satisfactory performance, working accurately and with a defined method; however, this approach does not entail understanding. Finally, a *surface-disorganized learning* approach minimizes the effort needed while satisfying the minimum requirements to complete a task, disregarding any concern for the topic or the sustainability of what has been learned. Froehlich et al.’s (2014) study cemented the importance of promoting deep learning in the workplace, as it was positively correlated with core skills development, perceived career progress and subjective job performance.

3.3 Beyond formal and informal learning

Some researchers argue that the historical distinction between formal and informal learning should be forgone “in favor of a more focused analysis of the structured norms, values, and practices in the workplace that concretely grant opportunities for participation and learning” (Billett, 2014).

The boundaries of formal and informal learning extend to learning strategies at work. Researchers have found five strategies to be present in many workplaces with distinct characteristics: mental repetition, seeking help in written materials, seeking help from others, intrinsic and extrinsic reflection, and trial and error (Brandão and Borges-Andrade, 2011). Only the last three were significantly correlated with professional development and facilitation of workplace learning (Haemer et al., 2017; Matsuo, 2012). These authors also call for the creation of a learning environment at work, allowing these strategies to occur often through individual exploration and exchange of experiences (Cangialosi et al., 2020).

Allowing employees to keep learning requires organizations to encourage workplace learning as the result of participation in any activity. For this reason, researchers focused

on creating an organizational learning culture, intended as the measurable and observable characteristics of the work environment, to ease employees' active participation, thus creating and developing communities of practice (Nikolova *et al.*, 2014). The role of organizational culture in enabling workplace learning is mostly indirect yet significant. Its influence impacts the perception of valuable knowledge and its allocation in a group, the integration of the latest knowledge available, the shape and role of social interactions, the availability of both peers and expertise, the frequency of learning opportunities, and even learning approaches and outcomes (Marsick, 2013; Lloyd *et al.*, 2014). Some researchers even called for a complete shift in the organizational learning culture paradigm, "from learning to work to working to learn," developing strategies aimed at increasing learning opportunities (Felstead *et al.*, 2011). Lee and Tan (2023) explore some of these strategies, emphasizing the potential of IT through knowledge-sharing systems, collaborative platforms and network builders in conjunction with mobile technology. The possibility to learn in diverse contexts, only when needed, and at a custom pace through mobile allowed microlearning as a strategy to rise (Lee, 2021). However, the lack of user experience and usability in microlearning currently hinders its ability to change organizational culture at a deep level.

3.4 Coming to grips with workplace learning

Overall, there is no consensus on which definition to use. Formal and informal learning in the real world usually tend to some elements of their counterpart; the "workplace features" approach instead relies on worker participation, meaning that organizations need to give incentives and develop a learning culture and environment. Both present the same underlying issue: intrinsic and extrinsic motivation. The former refers to actions done because an individual wants to do them, independent of the outcome; the latter is present when an individual acts to reach a chosen result (Legault, 2016). It is widely accepted that intrinsic motivation is what organizations should strive to increase, even if it cannot be directly influenced: this form of learning is associated with numerous benefits for the individual, including psychological well-being, enjoyment and persistence (Deci and Ryan, 2008).

Still, the most glaring issue concerns power issues established through social relations (Collin *et al.*, 2011). For example, a new employee may not show respect for individuals who possess more experience in the company, creating a seniority problem that hinders learning opportunities for both parties (Billett, 1995). Sometimes the context promotes negative behaviors from a workplace-learning perspective: managers often refrain from sharing their knowledge, understanding and skills with their colleagues to retain their position and power difference in social relationships, fearing what a change in the status quo would bring and ultimately hindering the learning potential of the employees (Wallo *et al.*, 2022).

3.5 Gamification as a motivational tool for employees

The most prominent theory on motivation is self-determination theory (SDT) which divides the intrinsic-extrinsic duality into distinct categories (Deci and Ryan, 2008). SDT proposes that the social environment must satisfy innate psychological needs: employees' perceived competence, relatedness and autonomy. In this context, competence is the drive to control the outcome and become an expert; relatedness is the universal desire to interact, to be connected to and care for others; and autonomy is the urge to be causal agents of one's own life (Ryan and Deci, 2000). Therefore, the level and quality of motivation that any individual possesses is heavily determined by the autonomy provided in an environment: in a workplace, it is the organization's mission to design such a context in return for increased motivation and loyalty (Deci and Vansteenkiste, 2004; Lemmetty and Collin, 2020).

Expanding on motivation types, SDT proposes a continuum within extrinsic motivation dependent on the level of internalization, intended as the degree to which behavior is self-determined (see Table 2). The most external forms of extrinsic motivation have been recognized as the causes of the deterioration of intrinsic motivation in employees (Mitchell et al., 2020). Identified and integrated regulations instead are considered to have an overall positive effect on total motivation perceived. The former type of motivation refers to self-endorsed and internally governed behavior, as the individual values or identifies with the outcome of the activity while also acting as the strongest predictor of employee performance (Zhang et al., 2016). The latter type is manifested with fully internalized behavior, often perceived as a means of self-expression, identity and psychological well-being (Weinstein et al., 2011). Intrinsic, integrated extrinsic and identified extrinsic motivation, when considered together, are defined as autonomous motivation, a construct positively correlated with desired outcomes for both individuals and organizations (Deci and Ryan, 2000). It is also valid as a strong predictor of effective performance, especially on heuristic tasks (Vansteenkiste et al., 2004). Furthermore, Baber et al. (2023) confirmed the mediation power of three factors affecting employees' intrinsic motivation. They proved that job expectations and positive reinforcement increased intrinsic motivation; meanwhile, the negative consequences of not pursuing learning in a self-directed way decreased it.

Knowing that, if conveyed correctly, extrinsic motivation is beneficial to employees, organizations began developing new methods before the academic world did (Domínguez et al., 2013). The most glaring example of this phenomenon is gamification, a topic that became popular only in 2011 with the success of *Foursquare* and the first paper that shaped this term (Deterding et al., 2011). That study defined gamification as “the use of game design elements in non-game contexts,” describing those elements in terms of their level of abstraction. Table 3 describes each type of gamification element, from the most tangible to the most abstract level (see Table 4).

3.6 Defining characteristics of a gamification approach

What captured the expectations of a more general public was the potential of gamification as a tool to strengthen behavioral and emotional engagement in learning tasks, change behaviors, and increase satisfaction and work performance (Kapp, 2012; Rigolizzo and Zhu, 2021; Thomas and Baral, 2023). These promises are not yet fully validated through empirical

| Type of extrinsic motivation | Nature of external contingency | Underlying reason for the behavior | Example |
|------------------------------|--|---|---|
| External regulation | Consequences, incentives, compliance | To receive or avoid a consequence; to fulfill an external requirement | “I avoid making prejudiced comments so that other people will think I'm nonprejudiced” |
| Introjected regulation | Feelings of internal pressure; to avoid guilt or to boost the ego | Because it “should” be done | “I avoid acting in a prejudiced manner because I would feel bad about myself if I didn't” |
| Identified regulation | Personal valuing of behavior; a sense of importance | Because it is important | “I avoid being prejudiced because it is an important goal” |
| Integrated regulation | Expression of self and identity; congruence with self and other values | Because it reflects core values and self/identity | “I avoid being prejudiced because I see myself as a nonprejudiced person” |

Table 2. Types of extrinsic regulation by level of internalization

Source(s): Authors' elaboration based on Legault et al. (2007)

| Level | Description | Example |
|---------------------------------------|--|---|
| Game interface design patterns | Common, successful interaction design components and design solutions for a known problem in a context, including prototypical implementations | Badge, leaderboard, levels |
| Game design patterns and mechanics | Commonly reoccurring patterns of the design of a game that concerns gameplay | Time constraint, limited resources, turns |
| Game design principles and heuristics | Evaluative guidelines to approach a design problem or analyze a given design solution | Enduring play, clear goals, variety of game styles |
| Game models | Conceptual models of the components of games or game experience | MDA, challenge, fantasy, curiosity, game design atoms, CEGE |
| Game design models | Game design-specific practices and processes | Playtesting, play-centric design, value-conscious game design |

Table 3. Levels of game design elements by the level of abstraction

Source(s): Deterding *et al.* (2011)

| | Qualities | Drawbacks | Own conclusions |
|-------------------------------|---|---|--|
| Gamification in the workplace | <ul style="list-style-type: none"> + Projects are brief: more attempts + Highly effective in increasing engagement and motivation, albeit temporarily + Can be part of a bigger work-life balance plan | <ul style="list-style-type: none"> - Knowledge retention rates and motivation fall after the end of a project - Used as a substitute for serious games, with effects opposite of what was intended - Usually, a compulsory activity - Very vulnerable to the novelty effect | Periods |
| Gamification of the workplace | <ul style="list-style-type: none"> + More knowledge-sharing and consolidation + Permanent improvement of employees' learning experience + Promotes a worker-centric organizational culture + Shapes the physical workplace and employees' behaviors | <ul style="list-style-type: none"> - Corrosion of employees' privacy in most areas at work - Necessary to rethink how goals are defined, measured, and managed - Hard to define what kinds of knowledge are meaningful and what kinds are not | The aim is to allow employees to share their knowledge through gamification, as an informal way of learning. Currently, it has the potential to achieve lasting organizational changes |

Table 4. Characteristics of gamification as currently implemented ("in the workplace") vs characteristics of gamification as proposed in this paper ("of the workplace")

Source(s): Table by authors

studies (Thomas *et al.*, 2022), but many companies still proclaim their success in implementing gamification. For example, they claimed an improvement in their organizational culture by accepting the failure of an initiative. Those initiatives are carried out almost exclusively online through a Learning Management System platform, and the

results obtained after its realization may not persist over time (Hamari, 2013). Often, LMS platforms make heavy use of interface design patterns such as leaderboards and achievements, with both physical and social contexts playing a prominent role in their effectiveness (Hamari *et al.*, 2014; Palaniappan and Md Noor, 2022). These simple gamification elements address the perceived need for compelling and task-oriented learning content but aren't sufficient to answer to the needs of any organizational level (Palmquist, 2023). To do so, other strategies must be added into the mix to introduce characteristics that make gamified activities engaging and entertaining (Luo, 2022; Hagedorn *et al.*, 2023).

The idea to introduce shallow game mechanics to generate interest is the indirect result of combining three features from massively multiplayer online role-playing games (MMORPGs): “nudging” or trigger, status or ability, and feedback or motivation. A game or gamified activity needs all three features to engage a player intrinsically. Each element also enables a distinct perspective of gamified activities (Idone Cassone, 2016). Through the trigger lens, games are engagement models: disrupting the monotony of daily routine, the individual acts in a regulated and exhibited way inside the game. From the status standpoint, gamified activities are models of fairness and justice: tasks and duties are assigned without biases, and the evaluation system is equal for and applied to all participants. Last, as a function of their feedback, games become efficient activities: players usually strive for their perceived best outcome, improving their abilities while seeking a strategy that realizes that outcome and keeping their motivation high. Furthermore, it also raises perceived career success and lowers turnover intentions, especially in learners that believe less in their own abilities and competencies to achieve their goals, allowing for a more continuous and involved learning experience (Lehtonen *et al.*, 2022; Huber *et al.*, 2023) These game elements are inextricably linked to gamification characteristics by design: gamified activities should induce different kinds of experiences (nudge, flow, alternate reality and hedonic – Thomas *et al.*, 2023) and should always be *user-centric* rather than *mechanism-centric* (Dale, 2014).

3.7 Requirements and problems of gamification

A user-centric mentality when applying gamification is necessary for its success, as organizations want to harness its power for one reason: encouraging certain behaviors in employees that are considered beneficial to the organizations' objectives. Regrettably, gamification tools are not enough to improve the chances of success of any program without also considering the final users' current and desired level of expertise, along with appropriate learning behaviors (Rigolizzo, 2023). These mechanisms must be applied together with persuasive design to tweak both freedom and fairness of the gamified system in the organization's favor, a conclusion stemming from the “nudging” perspective described earlier (Thaler and Sunstein, 2008). While scholars reported the harmful potential of persuasive design for intrinsic motivation and creativity (Prendergast, 2008), later research proved that, as long as individuals have some control over the given reward, they perceive more autonomy and motivation (Patall *et al.*, 2008; Gerhart and Fang, 2015). Gamification needs other learning strategies to allow individuals to develop and build their skills and knowledge properly (Kittel and Seufert, 2023b). The most common combinations involve strategies like reflection and experimentation (Matsuo, 2012) or different features (Luarn *et al.*, 2023), such as game design mechanics or principles.

The debate on monotony and using tools like gamification to mask work activities has been going on for more than 50 years Lévi-Strauss (1966) was the first to define games at work as a “rite of production” whenever only one outcome is selected and accepted because of its symbolic or economic value, stripping games of any meaningful choice that could be taken and, therefore, any autonomy initially given to participants. Ferrara (2013) argues that

exclusively implementing “useful” game elements cannot lead to significant success. For him, games are a powerful communication medium to deliver one or more core messages, which players discover by themselves through self-directed discovery and meaningful choices. The ability to influence outcomes is perceived as vital to individuals: its absence can sabotage employees’ autonomy and moral character (Kim and Werbach, 2016). Almeida *et al.* (2023) further reinforces these concerns, as their qualitative study links many gamification elements to the negative effects experienced by the interviewees, highlighting the worsened performance of the tools in response to a lack of control over their gamified learning experiences.

Of equal concern are ethical issues, beginning with Georgia Institute of Technology professor Ian Bogost (2011), who refutes the concept of gamification itself. In his opinion, this practice is a tool for hiding the true intentions of whoever promotes it: exploiting the latest trend by making a half-hearted effort for personal gain. Tackling the same issue from a sociological perspective, Rey (2012) denounces the collection of personal data used to shape individual behavior before and during the gamified activity. His main concern is that companies would try to use gamification as a palliative to reduce or eliminate alienation born from the work activity while raising expectations as a process of producing *playbour*, described as a hybrid form of both play and labor (Kücklich, 2005).

3.8 The “plot holes” in workplace learning

Using the current perspectives to combine workplace learning with a recent research field, such as gamification, offers many opportunities to propose new theories or applications. For example, gamification could ease the process through which communities of practice inside the workplace: by transforming ideas into information into knowledge or by helping information literacy and spread (Middleton and Hall, 2021). However, almost no piece of literature elaborates on different implementations of this technique for learning, instead studying the current practices in education, such as tailoring gamification to student types (Oliveira *et al.*, 2023). Tranquillo and Stecker (2016) partially acknowledged the lack of discussion around different uses of gamification for learning. For them, “motivation strengthens engagement that leads to action to make a change in the environment. That change may serve to enhance or dampen self-determination, establishing a virtuous or vicious cycle.” Choi and Jacobs (2011) suggest that learning in the workplace, both formal and informal, must be integrated with the environment “to maximize the benefits of organizational investment on employee development”. Koivisto and Hamari (2019), as part of their thematic and theoretical agenda, also encourage perceiving gamification as “organizational and individual practices reminiscent of those which may be observed in games”, calling for “an acknowledgment of the dynamic, cyclical nature of gamification”. On the other hand, Bakhanova *et al.* (2020) highlighted the importance of context through its customization as a crucial step in developing strategies to promote certain behaviors and goals: practitioners have yet to use gamification to its full potential.

3.9 The frontiers of workplace learning and gamification

In the most recent years, Covid-19 had a tangible impact on many aspects of how everyone conceptualized work. In many countries, office employees had to quickly learn to recreate their workplace environment at home to carry on with all the activities that were previously done at work. The objective of managers and HR departments was to allow employees to perform and learn at home as they did before. Often, the tools provided to employees were already implemented in the organization, like e-learning, online classes or learning management systems. Later, their focus shifted to the learning strategies associated with these tools (Lee and Tan, 2023), such as mobile microlearning (Lee, 2021).

Researchers quickly followed suit, studying many aspects of this phenomenon while it was happening: for example, [Lantu et al. \(2023\)](#) proved that performance expectancy and conditions like organizational culture or adequate infrastructure positively affect the use intention of workplace e-learning. Others sought to measure how work-from-home impacted informal learning opportunities, suggesting that higher self-regulation (and, consequently, motivation) from an individual can offset the reduction of learning occasions ([Mühlenbrock et al., 2023](#)). Thus, the role of the individual in workplace learning has become the current focus of researchers: for example, [Goh \(2022\)](#) highlights the importance of change-over-time of an individual through changes in work role, agency toward learning and workplace culture. According to [Raemy and Barabasch \(2022\)](#), this focus on dealing with changes also stimulates employee resilience toward further changes and toward their work. [Kim \(2022\)](#) instead proposes to consider learning transferability, or “the ability to apply the knowledge an individual learned in different situations,” as one of the prominent causes of improved performance. Understanding how employees can use and share their new knowledge relies on individual actions, not on how knowledge is imparted initially. For this reason, many researchers ground their research on self-determination theory, as it offers a solid explanation for many observed behaviors in all forms of learning, especially education ([Kim, 2022](#); [Thomas et al., 2022](#); [Baber et al., 2023](#)).

On the other hand, gamification is a tool that is being implemented more and more as a tool to improve the learning experience and, therefore, knowledge acquisition ([Thomas et al., 2022](#)). Research on gamification wasn’t directly affected by the global pandemic but left a profound impact on the education world: classrooms were forcibly held online, and teachers and professors had to step up to the challenge with new ways to conduct a classroom. For this reason, gamification tools have been tried along with different strategies, such as microlearning and flipped classrooms ([Ekici, 2021](#); [Oliveira et al., 2023](#)). In contrast, companies couldn’t introduce game elements in the workplace for learning, as the main application until 2020 was mostly on training sessions or brief events ([Hamari et al., 2014](#); [Koivisto and Hamari, 2019](#); [Bakhanova et al., 2020](#)).

Overall, research in these fields is following two distinct paths, not truly delving into what the other field has to offer, and letting practitioners experiment more with gamification before investigating the potential of gamification for workplace learning. However, the importance of the work environment for the learning process is already well established ([Billett, 2014](#); [Kim, 2022](#)), and there is interest in understanding how certain elements added in a given context affect an individual’s learning experience ([Thomas et al., 2022](#); [Palmquist, 2023](#)). Therefore, in this paper, we develop a theoretical framework that features employees and their role in sharing and using knowledge. We do this by exploring the potential benefits of gamification applied to the learning process and how it can positively influence the workplace. In the following section, we will show how employees can impact the learning experience of their colleagues and improve their workplace while considering how the work environment affects (and is affected by) the way gamification is implemented, with the ultimate goal of augmenting the process and part of the outcomes of learning.

4. Another meaning, another context

4.1 Gamification of the workplace, not of work

As gamification practices became popular following the success of the *Foursquare* platform, organizations aimed to replicate the elements that made it successful in the first place. Various companies created systems that use game interface design patterns (see [Table 3](#)) to engage their employees in mundane or repetitive tasks, believing it could solve most motivational problems. However, it was soon evident how employees’ overall satisfaction

decreased: the gamified activity quickly became boring again for most individuals after the novelty effect wore off (Hamari *et al.*, 2014).

Unable to achieve clear net benefits, organizations then used gamification as a substitute for serious games, applying game design to educate their employees. In its current state, gamification exists under the same constraints as serious games: the gamified result should be visually and conceptually appealing to the designed participants and in a redefined environment, mostly over the short term. Participants should internalize these elements sufficiently well if these are to be effective under SDT principles: an issue that games solve by being intrinsically entertaining or “fun” (Eikelboom, 2016).

Until now, the definition of gamification offered by Deterding *et al.* (2011) and later studies focused on the “use of game design elements” while taking the “in a non-game context” segment as a given. This oversight inadvertently directed all research to current applications of gamification while leaving current practitioners the task of driving the development forward. Contrasting this trend, Eldor (2017) supports the creation of a learning climate in the workplace that encourages learning, knowledge exchanges and the realization of the organization’s vision. For reference, when creating serious games, the context is vital because its construction and limited scope are necessary to induce the student’s participation (Almeida and Simoes, 2019). By forcefully ignoring the existing constraint on context, the area that gamification can influence broadens, becoming the entirety of the physical workplace. Herein lies the evolution of gamification: it should be intended as a method to transform the workplace, enabling every worker to potentially become a voluntary participant, especially with Industry 4.0 technologies (Rechberg and Syed, 2014; Oke and Fernandes, 2020).

This change in perspective addresses two issues previously raised. Allowing gamification to permeate the workplace in its entirety means that it can function as a common ground for all employees to learn: any other strategy employed to share or grow the knowledge and skills of each individual can synergize with game design elements, directly fulfilling this requirement (Hamari, 2013) and promoting new learning behaviors at all organizational levels (Vu *et al.*, 2023). Such a system would complement the hybrid and extensible learning typical of digital technologies, allowing for more learning and innovation opportunities (Gardner, 2022). On the other hand, it is harder for gamification to be perceived as a tool for exploiting people: as long as participation is voluntary, each worker can internalize this change, aided by either conformity tendencies or the mere-exposure effect.

4.2 Starting a virtuous cycle: availability and examples

Any idea or project needs to bypass most variables or be flexible enough that practitioners can conceptualize and implement the parts most relevant to their situation (Schuldt and Friedemann, 2017). For this reason, the first step toward a gamified workplace should be to make gamification tools available to everyone, especially but not limited to game interface design patterns. The effect of making these and similar tools available to the entire workforce is twofold: many individuals will learn from direct or second-hand experience how game design elements will affect their activities, and communities of practice centered on the use of gamification will begin to form. These newborn communities will form the nuclei that generate knowledge and engagement in this aspect of the workplace simply by granting employees access to each other’s expertise and learning methods (Lloyd *et al.*, 2014).

When preparing to make gamification available to the workforce, organizations need to involve some employees in a pilot project to display the potential of gamification tools as a learning and motivational method, with the right elements (Mohanty and Christopher, 2023). Such a project, if successful, achieves multiple objectives at once: it creates experience and knowledge needed for the formation of a community of practice, engages employees

effectively because their participation in the project is not forced, and directly affects their environment, thus increasing perceived competence and autonomy on both gamification and the target gamified initiatives. These effects could represent the first compounded return on the gamification investment, imprinting initial momentum on the virtuous cycle to generate and sustain continuous learning in the workplace from both the informal learning and the organizational learning culture perspectives.

Following these events, the success of this transformation attempt should largely depend on the range of tools given to employees, the quality and effectiveness of the products of the pilot project, and the familiarity of individuals with games and digital environments (Murray and Moses, 2005; Spraggon and Bodolica, 2017). Participation in this transformation should be voluntary (Liu *et al.*, 2018); the whole point of the initiative is to incentivize autonomous motivation and the formation of an organizational learning culture. Kam and Umar (2023) suggest that the act of gamifying an activity increases autonomous motivation on participants and decreases the non-autonomous type; however, they had control only over their actions inside the exercise, not on the activity itself. For this reason, combining clear communication and voluntary participation means that employees are presented with a more meaningful choice on their actions, thus accepting the consequences of their decision day after day (Ferrara, 2013).

For the scope of this proposal, we identified three roles, not mutually exclusive. The “creators” try to affect their activities and the workplace with gamification tools. The “gamers” take part and enjoy the creators’ creations while learning in a unique way. The “habitat”, posing as the organizations’ point of view inside this model, promotes and adopts an organizational learning culture while addressing some problems that negatively affect employees.

4.3 The engine of a gamified workplace: the “creator”

In gamification efforts realized until now, employees have always been the recipients; the “creator” role is a subversion of this tradition and will need substantial aid, at least initially, to be able to support an established virtuous learning cycle. The creator should be the figure who will function as the practitioner of gamification inside the workplace. The aim is to allow any worker to improve their workplace by sharing their skills and knowledge through the game design tools at their disposal.

The benefits creators can enjoy through their activity are multiple, at least in theory. As creators, they can and will perceive the results of their efforts as a token of self-expression and their creativity as proof of their competence in the use of gamification as well as the gamified topic, improving their perceived well-being (Watson *et al.*, 2018; Xu and Hamari, 2022). Brandi and Iamone (2016) claim that “it is clear that the design and deployment of learning strategies in workplaces are key to bolstering lifelong learning”. Allowing employees to create gamified activities and environments by and for themselves could facilitate the design and deployment of corroborating learning strategies (Amenduni *et al.*, 2022; Haemer *et al.*, 2017; Blackman and Lee-Kelley, 2006).

A second, equally important reason to favor the formation of the creator’s role is the necessity of deepening the comprehension of the gamified topic through independent or collaborative research. For a creator, the need to expand their knowledge stems from the will to increase their perceived competence and to prove their self-improvement through their work. The autonomy that comes as a requirement for the creation process also increases motivation and engagement in creators, according to SDT (Roth *et al.*, 2007). On the other hand, the gamification tools often used in formal learning programs act on the perceived competence of creators, enabling them to perform self-initiated learning through intrinsic reflection and to integrate informal learning in the workplace (Svensson *et al.*, 2004). From the

learning approaches angle, if creators experience deep learning while understanding the topic to be gamified, their work could reflect this aspect, enabling “gamers” to pursue a deep learning approach as well. In other words, implementing one or more learning strategies when encoding knowledge promotes their use by other coworkers (Kittel and Seufert, 2023a, b).

Donning the vest of the creator can also enable the spread of digitally advanced tools in the workplace. Almeida and Simoes (2019) suggest applying Industry 4.0 tools to education, drastically improving personalization and flexibility, especially in virtual or “smart” learning environments. To highlight the potential of Industry 4.0 technologies in the education field, Gironacci *et al.* (2017) present a case study that explores the implementation of storytelling as a demonstration of game design principles and heuristics (see Table 3).

Another issue regards the starting situation present in the workplace. Dale (2014) expresses the necessity of respecting existing programs to avoid alienating wide portions of the workforce. Employees need to continue their current duties: adding ulterior tasks to each workload requires a compromise, which usually resolves in favor of the status quo. To further reduce the friction between usual work and creational activity, organizations need to communicate the importance of such a role, including a way to evaluate the creator’s results while not punishing failures: accepting and openly discussing them instead should become a valid learning strategy (Cangialosi *et al.*, 2020), as long as its not abused.

4.4 Gathering and sustaining momentum: the “gamer”

Each worker can benefit from the creators’ production. The employees who take part in the gamification process but do not wish to share their skills and knowledge can be identified as “gamers.” As recipients of the gamification efforts of their creator colleagues, most benefits and issues described in the literature review still hold; therefore, below are the elements that differ from a theoretical perspective.

The concept of voluntary adhesion to gamification has been previously discussed to solve the issue of forced participation. Those ideas are even more important when considering gamers, as they are the most vulnerable to the misuse of gamification. Communicating the right message is key: in this case, however, it might be more beneficial to present the improvements that gamification entails to persuade a sizable portion of the employees to shift toward integrating gamification into their work. In addition, if the acceptance of gamification comes from self-discovery through reflection or after seeking help and witnessing gamified activities, it may be possible to offset the loss of motivation and engagement induced by the novelty effect through the mediating effect of flow (Thomas and Baral, 2023).

As gamers participate, they accumulate experience and share it with others, including the creators of the gamified activity. Active involvement with the gamification system allows participants of all organizational levels to address their own needs, collaborating to acquire and generate feedback through a fair medium (Idone Cassone, 2016; Zhihao and Zhonggen, 2022; Palmquist, 2023). Herein lies the potential of this role: participants can give feedback to creators, enabling a stream of improvements that will increase the gamified initiative’s diffusion and popularity in the workplace. Feedback is crucial to sustaining engagement during and after the learning process thanks to its characteristics: namely, its frequency, intensity and immediacy (Kapp, 2012). The exchange of thoughts, opinions and suggestions between gamers and creators makes up the basis of gamification’s community of practice. In some cases, a gamer can also become a co-creator by helping the original creator develop and improve the gamified activity.

This process is reminiscent of the *playbour* concept first introduced by Kücklich (2005): he proposed a hybrid of work and play, describing the typical characteristics of the modding (modifying) process. As modders acted as developers for new game features, they

did so for the enjoyment of creating such elements and the validation and satisfaction from its wide use: they were autonomously motivated to work. While gamers in the workplace may not display the same level of motivation or competence, the feeling of changing the workplace positively from their perspective could be safely considered a sufficiently internalized behavior.

Last, a plausible consequence of this gamification process of the workplace is its normalization as a continuously engaging way to learn in a non-formal setting. In the gamified workplace, one or more elements that define formal learning can be absent without diminishing the effectiveness of gamification. For example, the presence of a designated teacher is not mandatory: the creator of the gamified activity is also a gamer while participating in its creation. The gamified initiative could even be conceived so that the gamer is alone in their experience – a likely scenario, if a given skill relies on a reflection learning strategy to be aptly internalized.

4.5 Enabling a learning culture: the “habitat”

All organizations, small or large, rent or own a physical space. The importance of the workplace is taken for granted: only in recent years have companies paid more attention to the design of their workplaces. Their goal, however, is quite different from what this paper proposes: their focus was on enabling employees to achieve a more manageable work–life balance, seen as part of the solution to increasing levels of stress while at work.

[Billett \(2004\)](#) proves the importance of learning in the workplace as the main place where this activity can happen for most adults. For this reason, the relationship between creators and “habitat” could be defined as symbiotic. While creators shape the environment physically and virtually, sharing their skills and knowledge, the habitat retains the shared information in a non-conventional medium. This process could be realized by creating a database of codified knowledge that further characterizes the environment while being available for the formation of any worker.

Just as the availability of gamification tools enables creators to gamify their workplace, it also allows learning opportunities that otherwise would not exist. In fact, a necessary condition for a new organizational learning culture paradigm is the creation of opportunities and the development of strategies ([Felstead et al., 2011](#); [Meyer and Dunphy, 2016](#)). [Nikolova et al. \(2016\)](#) also highlight the need to implement learning conditions as a requirement in the case of high restructuring of an organization, making the model described in this paper the cause and the foundation of such reorganization. From its point of view, stressing the importance of learning while shifting its own culture could be the main reason for adopting this proposal in the first place ([Kittel and Seufert, 2023a](#)).

Borrowing the “status” perspective, gamified initiatives have the potential to solve, at least partially, the power issues born from social relations. There’s an implicit idea of justice in games and gamified activities: the evaluation of gamers is equal for and applied to all participants. A strength of games lies in the assumption that any game is fair for everyone involved: this quirk allows people of different statuses in the workplace to be, albeit temporarily, at the same level, bypassing power and seniority issues while participating in the same game ([Billett, 1995](#)).

One final aspect to highlight is how the learning process happens. Both workplace learning literature and SDT recommend that organizations foster informal learning in the workplace through an increase in learning opportunities. These theories give particular emphasis to the role of the environment where learning takes place ([Spraggon and Bodolica, 2017](#)). When framing such learning activities as informal, gamification acts as a powerful communication medium between employees, who would still be able to learn in more traditionally informal ways. This shift in perception should increase the efficacy and

permanency of acquired skills and knowledge as this process is complemented by other learning strategies (Hughes *et al.*, 2020).

4.6 Possible issues of workplace gamification

From a theoretical perspective, this proposal displays clear benefits to both individuals and organizations. Still, there are some drawbacks or problems to address, the first of which is feasibility. Attempting any significant transformation requires tangible and intangible resources; however, transforming the physical workplace will require an even greater commitment of effort and resources. Thus, there is a high chance that only large organizations have enough resources and interest to pioneer the approach described here.

Another issue is time: the preparatory steps alone require a thorough analysis of the current situation of the workplace and its employees. This process should include the draft of a plan to make gamification tools mostly compatible between employees and the topics to be addressed by the pilot project. After these steps, and assuming they succeed, workplace gamification will take a long time to get fully started. It heavily relies on the birth of a community of practice in the workplace that revolves around the sharing of knowledge through gamification, and it can only happen through the accrued experience of its members and a favorable social environment.

Lastly, the notion of knowledge, in particular useful knowledge, should be better defined in theory and by organizations. While the literature on knowledge is constantly expanding, organizations' idea of useful knowledge is deeply subjective, as it depends on factors like the industry to which the company belongs, the existing tools, the roles employees assume, and more. It is important to recognize that knowledge can take many forms, and deciding which ones are valuable to a particular organization heavily influences how this proposal could be realized in the workplace.

5. Discussion

The concept of “gamification *of* the workplace” has not yet been explored in the literature, unlike its counterpart, “gamification *in* the workplace” (Ferreira *et al.*, 2017). A closely related topic that is gathering attention is innovation through gamification, where workplace climate plays a role in promoting learning opportunities through reflection and experimentation. However, this venue of research focuses on the behaviors manifested by employees (Patricio *et al.*, 2020; Rigolizzo and Zhu, 2021) instead of how to share the required knowledge and prolong gamification's effectiveness. The current state of gamification still leaves practitioners the responsibility to implement gamification correctly while not considering the need for the workplace to be changed. By gathering and synthesizing the most prominent concepts about “workplace learning” and “gamification” literature, the authors presented a complete view of the characteristics of gamification. In doing so, they also advance research on the flow of knowledge inside the workplace using gamification tools, at least at a theoretical level (Spanellis *et al.*, 2020).

From the current effort on the effects of gamification initiatives on people and organizations, we focus on the duration and the role of context for gamification, allowing us to change how work is conceptualized (Smith-Robbins, 2011). In addition, we explore the cyclical nature of gamification as a more effective way to learn at work (Koivisto and Hamari, 2019) by building a community of practice centered on how to improve the workplace through these instruments. Therefore, we start by describing the concept of a gamified workplace by extending the context of gamification from a single room or piece of software to the entirety of the physical workplace. Then, we discuss the possibility of establishing a virtuous cycle of learning with and through gamification: “creators” share and improve their personal and

work-related knowledge, “gamers” learn with their preferred method of learning and playing, and the “habitat” (i.e. workplace context) is molded and improved by the people that use the workplace and now have the effective means to do so. This perspective of gamification of the workplace could be a complementary view of the design factors described by [Palmquist \(2023\)](#): his work explores how the same perceived needs that gamification should satisfy through different organizational levels, while here we describe the roles they would take in such a system.

The interdependence between these roles highlights the current bias of practitioners of considering employees merely as recipients; instead, we propose a self-sustaining model in which all parties are more involved because their interests align with those of the organization and vice versa. As [Table 5](#) suggests, gamification has the potential to enhance existing learning activities, albeit with the limits already discussed, or to allow users to share their knowledge with colleagues for longer and in a better, more enticing way.

5.1 Managerial implications

Gamification is not a passing trend but a significant phenomenon that is bound to transform the way we work and manage. Understanding the appropriate circumstances at work for applying gamification and linking them to company strategy is essential to enhance the learning experience and maximize the positive effects of gamified learning over the long term ([Hemmler et al., 2023](#)). The cost of implementing gamified learning experiences poorly is the failure of such an investment: Marriott, the world’s largest hotel chain, “quietly shut down” its gamification efforts after initially touting the results achieved, mainly because it lacked an understanding of how to make the process work.

Based on current research, gamification is best suited for learning contexts that require rapid and efficient learning or where the decay in learning retention is not a disadvantage, such as seasonal work or event organization training. However, gamification in its current state is heavily susceptible to the novelty effect and, where present, the achievement of the highest or best reward ([Zhihao and Zhonggen, 2022](#)). Although some studies support the argument that it improves knowledge retention rates temporarily ([Trevors and Ladhani, 2022](#)), its current implementation often elicits the opposite effect in the long term ([Hamari et al., 2014](#)). Since engagement and motivation perceived by individuals directly affect learning outcomes and wear off rapidly, gamification becomes a riskier investment for companies because one of their main expectations in promoting learning at work is to increase their employees’ performance ([Lantu et al., 2023](#)). This expectation can be met by providing a learning experience that allows employees to consolidate and share their knowledge for as long as possible. The framework described in this paper can help

| Key conclusions related to current gamification | Key conclusions related to the proposed system for gamification |
|--|---|
| Directly applied on top of activities | Activities are thought onto game design elements |
| Users only enjoy the gamified activity | Users can also create these activities |
| Loses efficacy after novelty effect wears off | Stays relevant by creating new gamified learning opportunities |
| Focuses on motivating users to learn through external, introjected and identified motivation | Focuses on cultivating identified and integrated motivation to learn more |
| The objective is to teach knowledge in a more engaging way | The objective is to share knowledge inside the organization, permanently |

Source(s): Table by authors

Table 5.
A direct comparison of the key conclusions between the two separate ways to apply gamification to adult learning

practitioners in their efforts by identifying the elements of the workplace they could improve and how gamification can be used to that end.

First, employees could be granted access to gamification tools (e.g. learning management systems, dedicated spaces, metaverse) to incentivize them to codify their knowledge as they create learning experiences for others, thus sharing their know-how with colleagues. This aspect is especially relevant: incentivizing learning behaviors is how an organizational learning culture is established (Kittel *et al.*, 2021) and informal learning takes place. Employees can designate themselves a position based on their personal use and establish a new community of practice focused on how to utilize gamification to learn. In this way, gamified activities are user-centric by definition, as the final users design their learning experience (Dale, 2014), further enhancing the effectiveness of gamification.

Second, by utilizing a combination of learning methodologies most suited to the sort of knowledge at hand, practitioners can direct and collaborate with employees to develop gamified activities that maximize the number of learning opportunities. To a certain extent, the work of Tomczyk and Teckchandani (2023) can be used to guide the gamification process of already existing activities. Companies are always concerned about the relevance and usefulness of the knowledge that their employees acquire, and it goes double for gamification initiatives. Perryer *et al.* (2016) reiterate this concept: gamified systems should align with already existing tasks and objectives, and they should have elements that stretch participants' knowledge, skills and abilities. In other words, if gamification is to succeed as a medium to learn in the workplace, participation from both employees and the organization is essential.

Third, practitioners can develop a customized learning system that can be maintained within the company for at least several years by utilizing the “creator,” “gamer” and “habitat” roles. There's growing evidence that gamification is best used when thought of as a cycle (Koivisto and Hamari, 2019). In the paper, we conceptualized individuals acting as a “creator” and a “gamer” cyclically: an individual can act as a creator when helping others design a gamified activity while behaving as a gamer when enjoying other creations. However, the entire workplace can turn into a suitable learning context as long as gamification is used to establish any kind of learning cycle in conjunction with other strategies (such as alternating formal and informal learning, reversing the teacher–student or speaker–audience roles, and learning in physical and virtual spaces seamlessly). Managing workplace learning as a cyclical event, paired with the use of game design elements, allows organizations to harness the lasting effects of change over time (Goh, 2022). In this way, gamification can have positive long-term impacts on people and companies alike, such as increased autonomous motivation and decreased non-autonomous motivation (Kam and Umar, 2023), more effective learning due to more opportunities for informal learning (Muzam *et al.*, 2023), and, if it wasn't already the case, a learning-oriented organizational culture.

5.2 Future research

In the second part of the literature review we manually mapped the papers most representative of their category so as to better visualize the contribution of this paper (see Figure 1). The definition and the names of the clusters are taken from Koivisto and Hamari (2019). The literature review of this paper focused primarily on the psychological and behavioral effects of gamification, as those were necessary to contextualize the outcomes of the study. However, it also means that the correct choice and use of affordances (or game design elements) to sustain such a system was not sufficiently explored here, thus marking the first area of future research. Furthermore, the framework we propose needs to be tailored to the needs and issues of any given industry, as what is considered “useful knowledge” changes with each context (see Figure 2).

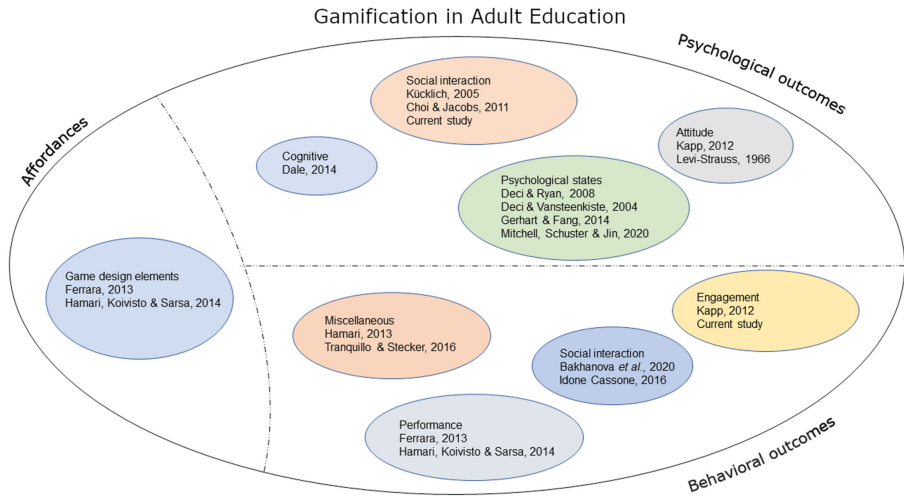


Figure 1. Spatial representation of the main topics presented in part 2 of the literature review

Source(s): Figure by authors

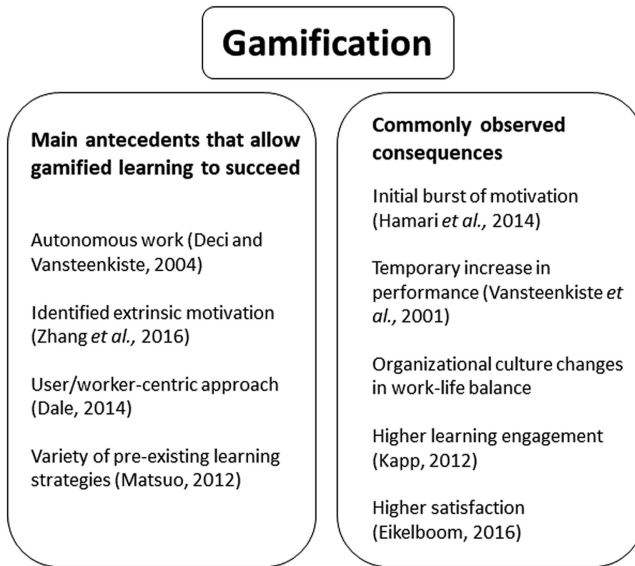


Figure 2. Summary of conclusions regarding gamification's adoption and results

Source(s): Figure by authors

While the theoretical framework outlined in this study intends to facilitate learning through gamification in the long run, it does not address the question of the time required for its maintenance. This shortcoming is a clear target for future research: time management is a critical factor in implementing such a system, and the current literature offers little in this regard. Since learning is a part of work, researchers should consider the amount of time allotted to this purpose for each employee, primarily because it could vary from individual to individual and between roles in the organization (Goh, 2022).

Another field of research is about the specific tasks of management in pursuing continuous learning. While we discussed the importance of initial guidance to generate interest and drive the process of knowledge sharing, its level of involvement is less clear. Future research could concentrate on finding the right balance between monitoring or controlling creators' work to prevent misuse of gamification or its decline into irrelevance and granting autonomy to creators in deciding both the content and method for knowledge sharing.

To prevent issues or abuses when implementing gamification as a learning tool, we invite researchers to inquire further on the ethical aspects of gamification tools, especially in more extensive applications such as those suggested in this paper. This inquiry is critical since the very essence of knowledge sharing involves freedom. It is essential to strike a balance between this principle and the imperative to incorporate game design elements in the workplace. Finding the appropriate equilibrium between overseeing workplace learning and enabling employees to freely exchange and accumulate knowledge is also a pivotal subject warranting comprehensive exploration.

Investigating the long-term consequences of gamification tools in adult education is the final research topic that warrants further attention. As a result of the necessity to comprehend results at the individual, group or organizational levels, short- and long-term effects were typically not regarded an essential component of studies on gamification. The lack of a long-term focus when discussing gamification's use and its effects reflects its use in many organizations and the relatively short life of gamification, established in 2011. However, we believe that continuous or long-term use of gamification in the workplace is an area that warrants further research relevant to all researchers and practitioners that know gamification is here to stay.

To summarize, our research advocates for the implementation of learning cycles as an essential element for improving the learning experience of employees and the overall workplace environment through the participation of employees in the knowledge-sharing process, using gamification as a medium. As an old Chinese proverb goes, "I hear, and I forget; I see, and I remember; I do, and I understand." We add to this, "I teach and I share," through gamification.

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(The Appendix follows overleaf)

| Concept assigned | Author(s) | Year | Concept assigned | Author(s) | Year | | |
|--|-----------------------------------|------------------------|--|-----------------------------|---|-------------------------|------|
| 3.1: Workplace learning definition | Lave and Wenger * | 1991 | 3.6: Motivational elements of gamification | Kapp | 2012 | | |
| | Eraut | 2000 | | Thomas <i>et al.</i> | 2022 | | |
| | Guile | 2019 | | Hamari * | 2013 | | |
| | Manuti <i>et al.</i> * | 2015 | | Hamari <i>et al.</i> * | 2014 | | |
| 3.2: Formal and informal learning definition | Stern and Sommerlad | 1999 | 3.7: Antecedents to apply gamification for learning | Idone Cassone | 2016 | | |
| | Marsick and Watkins * | 2001 | | Dale | 2014 | | |
| | Kyndt <i>et al.</i> * | 2009 | | Thaler and Sunstein | 2008 | | |
| | Eraut * | 2011 | | Patal <i>et al.</i> | 2008 | | |
| | Berings <i>et al.</i> | 2008 | | Gerhart and Fang | 2015 | | |
| | Biggs | 1979 | | Matsuo * | 2012 | | |
| 3.3: Other approaches to workplace learning | Froehlich <i>et al.</i> | 2014 | 3.8: Issues of gamification | Luarn <i>et al.</i> | 2023 | | |
| | Billett | 2014 | | Ferrara | 2013 | | |
| | Brandão and Borges-Andrade | 2011 | | Kim and Werbach * | 2016 | | |
| | Haemer <i>et al.</i> | 2017 | | Middleton and Hall | Oliveira <i>et al.</i> | 2022 | |
| | Cangialosi <i>et al.</i> * | 2020 | | | Ekici | 2021 | |
| | Nikolova <i>et al.</i> * | 2014 | | | Tranquillo and Stecker * | 2016 | |
| | Marsick | 2013 | | | Choi and Jacobs | 2011 | |
| | 3.4: Issues of workplace learning | Lloyd <i>et al.</i> * | | 2014 | 3.9: Recent progress on gamification and workplace learning | Koivisto and Hamari * | 2019 |
| | | Felstead <i>et al.</i> | | 2011 | | Bakhanova <i>et al.</i> | 2020 |
| | | Lee and Tan | | 2023 | | Lantu <i>et al.</i> | 2023 |
| Lee | | 2021 | Mühlenbrock <i>et al.</i> | 2023 | | | |
| Legault | | 2016 | Goh | 2022 | | | |
| Deci and Ryan * | | 2008 | Kim | 2022 | | | |
| 3.5: Gamification to motivate | Collin <i>et al.</i> | 2011 | Note(s): The 19 papers selected after the in-depth analysis phase have been identified with the * sign | Source(s): Table by authors | | | |
| | Billett | 1995 | | | | | |
| | Deci and Ryan * | 2000 | | | | | |
| | Deci and Vansteenkiste | 2004 | | | | | |
| | Lemmetty and Collin | 2020 | | | | | |
| | Mitchell <i>et al.</i> * | 2020 | | | | | |
| | Zhang <i>et al.</i> | 2016 | | | | | |
| | Weinstein <i>et al.</i> | 2011 | | | | | |
| | Vansteenkiste <i>et al.</i> | 2004 | | | | | |
| | Babel <i>et al.</i> | 2023 | | | | | |
| Domínguez <i>et al.</i> * | 2013 | | | | | | |
| Deterding <i>et al.</i> * | 2011 | | | | | | |

Table A1.
Summary of literature used throughout the review, as a result of the process described in the method section

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