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Experience matters: The mediating role of gameful experience in the relationship between gamified competition and perceived innovation culture

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Employees perceiving their organizational culture as innovative increase their output and enhance company performance. A potential approach to improving employees' perception of an innovation culture involves implementing gamified competition in the workplace. Despite the numerous studies on gamified competition, its relationship with employees' perceived innovation culture and the role of their gameful experience remains unclear. On the basis of affordance theory, we explain how gamified competition increases employees' perceived innovation culture (inter-perception) through the mechanism of gameful experiences (intra-perception). We survey a sample of 382 sales employees from German credit institutions who work with a gamified sales application. With the use of structural equation modelling, we find that gamified competition is positively related to perceived innovation culture. However, when including the mediator, results show that employees' gameful experience fully mediates the relationship between gamified competition and perceived innovation culture. Our study underlines the need for research to shift to an experience-oriented employee perspective that will enable a better understanding of the impact a gamified competition has on employees' perceptions. Our findings can help managers to design, predict, and adapt gamified competition in the workplace.

KEYWORDS
gameful experience, gamification, gamified competition, intra- and inter-perception, perceived innovation culture

1 | INTRODUCTION

Employees' perception of their company's innovation culture plays a strategic role: A favourable perception improves organizational performance, fosters productivity and job satisfaction and decreases employee turnover (Jiménez-Jiménez & Sanz-Valle, 2011; Movaghar et al., 2021). Companies hence increasingly strive to promote an innovation culture. In this context, earlier studies highlight the influencing role of workplace structures such as flat hierarchies, work teams and communication characteristics (Bayhan & Korkmaz, 2021; Martins & Terblanche, 2003; Szczepańska-Woszczyna, 2014). However, it is still unclear how companies can practically implement these structures quickly and with minimal bureaucratic effort.

In this regard, the topic of gamification has recently received attention in the literature. Gamification refers to a design approach that implements game elements—such as competition

through leaderboards, rewards through points and personalization through avatars—in a non-game context (Deterding et al., 2011; Hamari et al., 2014; Huotari & Hamari, 2017). According to affordance theory, these game elements represent a stimulus that positively affects employees' psychological perceptions (Gibson, 2014; Huotari & Hamari, 2017), which form the basis for research (e.g., Huang & Zhou, 2021; Ikhide et al., 2022; Xu et al., 2022, 2023). These perceptions can be structured along two dimensions: employees' self-perception, such as their level of engagement and fun (intra-perception), and employees' perception of their work context, such as their company culture (inter-perception) (e.g., Jones et al., 2003; Knudson et al., 1980).

While research started to investigate outcomes of game elements (e.g., Huang & Zhou, 2021; Ikhide et al., 2022; Xu et al., 2022, 2023), three gaps remain: First, there is a gap on whether the implementation of game elements leads to positive or negative outcomes. Extant research reveals mixed findings: Studies point to several positive outcomes of gamification (Landers et al., 2018; Liu et al., 2017; Vesa et al., 2017), such as reduced stress and enhanced focus (Patricio et al., 2022), increased quality of work in task completion (Hosseini et al., 2022) and employee engagement leading to positive work behaviour (Hamza et al., 2022). Suh et al. (2017) find that engaging with a gamified information system stimulates an employee's aesthetic experience, thereby explaining the employee's continued intention to use the gamified system. Other works, in contrast, indicate negative effects of gamification (Armstrong & Landers, 2018; Hammedi et al., 2021; Leclercq, Poncin, Hammedi, Kullak, & Hollebeek, 2020), such as conflictual interactions (Leclercq et al., 2017), constraints on employee creativity (Ikhide et al., 2022) or a decline in employee engagement and well-being (Hammedi et al., 2021). Thus, Wünderlich et al. (2020) and Khan et al. (2020) call for further research on whether the implementation of game elements leads to positive or negative outcomes.

Second, there is a gap in the literature on outcomes of game elements on the level of inter-perception. So far, scholars have mainlyinvestigated the effect of gamification affordance on individuals' self-perceptions (e.g., Khan et al., 2020; Seaborn & Fels, 2015), limiting its relevance to company-wide outcomes. Only a few studies explore outcomes on the level of employees' intra-perceptions, such as a perceived culture of employee involvement (Hamza et al., 2022; Miciuła & Miluniec, 2019). Landers et al. (2018) request further exploration of the factors in gamification research that explain how game elements affect employees' inter-perceptions. In fact, research neglects such potential mediating variables (Helmefalk, 2019; Koivisto & Hamari, 2019; Seaborn & Fels, 2015).

Third, there is a gap to investigate the outcomes of game elements in the work environment. Specifically, gamification researchers highlight the underrepresented management context (Hammedi et al., 2021; Koivisto & Hamari, 2019; Landers et al., 2018) and the lack of research on gamification in the workplace (Deterding, 2019). Schöbel et al. (2019) demand better categorization outcomes of game elements to provide evidence of gamification in companies.

Consequently, this study aims to address the three identified research gaps. We investigate the relationship between gamification and perceived innovation culture (inter-perception) in the workplace and include the role of the gameful experience as an important self-perception (intra-perception) in explaining this relationship. Gameful experience is a multi-dimensional construct that refers to the positive emotional and involving qualities of using a gamified application (Eppmann et al., 2018). Scholars ask for an increased understanding of the relationship between game elements and the gameful experience of employees (Koivisto & Hamari, 2019; Liu et al., 2017), as well as an extension of the nomological network (Eppmann et al., 2018).

Accordingly, our research questions inquire: What influence does gamified competition have on the perceived innovation culture in the workplace? What role does employees' gameful experience have in this relationship? This study aims to explore in detail the effect of gamification on employees' intra- and inter-perceptions to develop a better understanding and improve the application of meaningful gamification in the workplace.

We empirically examine our research model with a sample of 382 sales employees from German credit institutions who work with a gamified sales application to promote sales activities. Our findings contribute to gamification research in several ways. First, we explain one of the outcomes of gamified competition, namely, perceived innovation culture, through the mechanism of gameful experiences, thereby implementing an intra- and inter-perspective in line with affordance theory. With this, we add to the so far mixed findings on gamification outcomes as we uncover further positive effects of gamified competition on intra- and inter-perception level. Second, as called for by Eppmann et al. (2018), we continue to develop research related to gameful experience—especially by analysing such experience as a mediating variable and explaining that employees need to feel joy for the gamified competition to trigger the perception of perceived innovation culture. Third, we expand the gamification literature by considering the workplace setting to understand better the benefits that gameful experience has as a result of an adapted workplace design that features gamified competition.

2 | THEORETICAL FOUNDATION AND HYPOTHESES DEVELOPMENT

2.1 | The affordance theory

Gamification is the process of implementing game elements in a non-game context to influence the experiences, perceptions and behaviours of employees (Deterding et al., 2011; Hamari et al., 2014; Huotari & Hamari, 2017). This influence can be explained by Gibson's (2014) affordance theory, which postulates that employees perceive the stimulus character of an object in the environment, which, in turn, stimulates psychological perceptions and, consequently, behavioural outcomes. Scholars argue that the stimulus character of an object should be considered as affordance—an offer or possibility to perceive and/or engage with the object (Hamari et al., 2014; Huotari &

Hamari, 2017). This relationship between objects and human response has become popular in research exploring interactions between humans and computers and forms the basis for gamification research (Huotari & Hamari, 2017).

According to affordance theory, game elements present an affordance stimulating employees' perceptions. To gain further insights into the individual perception of employees, we extend the theory by employing a structure that more clearly stratifies the perception dimensions stimulated by gamification affordances. Specifically, we utilize a structure inspired by earlier research on intra-perception and inter-perception outcomes (Jones et al., 2003; Knudson et al., 1980). Intra-perception refers to the self-perception of employees in relation to an affordance, which we explore in terms of gameful experience. Inter-perception relates to employees' individual perception of the company, which we analyse through perceived innovation culture. In developing affordance theory, Gibson (2014) postulates that affordance triggers an individual's emotional state (intra-perception). However, Gibson (2014) refers to the stimulus character of an object in the environment, meaning this object likewise triggers an individual's contextual perceptions of that environment (inter-perception). While this argument extends the original affordance theory, preliminary evidence of that extension can be found in notable exceptions in the literature that investigate the relation between gamification affordances and perceived company culture: Suh and Wagner (2017) show that gamification affordances, such as gamified competition, influence employees' perceived hedonic values of a company's collaboration system. In addition, findings indicate that gamification leads to a company culture of employee involvement—for example, regarding the development and management of human capital (Miciuła & Miluniec, 2019) and employee engagement leading to positive work behaviour (Hamza et al., 2022). While these studies highlight the positive impact of game elements on employees' perception of company culture, game elements' relation to perceived innovation culture remains unclear.

Thus, on the basis of affordance theory and the conceptual extension of perception dimensions, we explore the relationship between a game element (i.e., gamified competition) in the workplace as affordance and employees' inter-perceptions (i.e., perceived innovation culture) and intra-perceptions (i.e., gameful experience) as outcomes.

2.2 | Gamified competition and perceived innovation culture

Gamification literature discusses a variety of game elements, for example, points, badges, avatars and leaderboards (Koivisto & Hamari, 2019; Seaborn & Fels, 2015). Moreover, different definitions and interpretations of game elements exist, which provide possible categorization approaches (Blohm & Leimeister, 2013; Deterding et al., 2011; Hunicke et al., 2004; Werbach & Hunter, 2012). Following Deterding et al. (2011), we define game elements as game-characteristic features that take a key role in the game application. In line with the literature (Helmefalk, 2019; Koivisto & Hamari, 2019; Suh & Wagner, 2017), we operationalize game elements as gamified competition, which we define as elements allowing employees to compare their performance with that of others by ranking their activities.

We introduce perceived innovation culture as potential outcome of gamified competition. We follow Chang and Lin (2007) and define perceived innovation culture as employees' individual company perceptions (inter-perceptions) characterized by creativity, entrepreneurship, adaptability and dynamism. An innovation culture functions as an important precondition for the innovation process in a company (Movaghar et al., 2021; Tushman & O'Reilly, 1996). Thus, it is an essential strategic determinant for sustainable innovation and company performance (Davies & Buisine, 2018; Dombrowski et al., 2007). An innovation culture influences competitiveness through, for example, new product or sales ideas (Uzkurt et al., 2013). Therefore, considering perceived innovation culture as an individual inter-perception outcome of employees is relevant.

On the basis of affordance theory and the conceptual extension of perception dimensions, we argue that gamified competition is a gamification affordance that positively influences perceived innovation culture. Gibson (2014) states that individuals perceive an object's stimulus character in their environment. In our context, employees engage in gamified competition (i.e., a stimulus) at their workplace (i.e., their environment). Perceived innovation culture refers to employees' perception of their environment—in this case, their company. By engaging in gamified competition and comparing their performance with that of others in the company (i.e., a stimulus), employees adapt their inter-perception of the company (i.e., their environment). As such, based on affordance theory and the conceptual extension of perception dimensions, gamified competition positively relates to perceived innovation culture. Moreover, we argue that the game element of gamified competition stimulates employees to perceive their company culture as innovative because gamified competition entails game-characteristic features and performance rankings within the non-game context of the workplace (Deterding et al., 2011; Huotari & Hamari, 2017). Organizational mechanisms, structures and communication features are essential factors influencing the perception of an innovation culture (Bayhan & Korkmaz, 2021; Martins & Terblanche, 2003; Szczepańska-Woszczyna, 2014). Dombrowski et al. (2007) and Villaluz and Hechanova (2019) highlight that communication, safe spaces, collaboration, incentives and leadership foster an innovation culture. Gamified competition is an organizational mechanism and thus an affordance as it entails rules and prescribes structures, team-building activities and clear rewards for progress within the activities and performance achievements. Moreover, gamified competition embeds new company-wide communication features promoted by the transparent presentation of a performance ranking, its publication and communication. Thus, gamified competition is positively related to perceived innovation culture.

Several studies support our rationale, showing that gamification positively affects organizational culture (Hamza et al., 2022; Miciuła &

Miluniec, 2019). In addition, Patrício et al. (2018) point out in their literature review that gamification approaches can foster companies' innovation process, which should also positively influence how employees perceive innovation culture. We hence argue that the stimulating nature of the gamified competitive affordance is positively related to employees' inter-perception of companies' innovation culture and hypothesize:

> **Hypothesis 1.** Gamified competition is positively associated with perceived innovation culture.

2.3 | Gamified competition, gameful experience, and perceived innovation culture

The implementation of gamified competition as a game element in the workplace acts as a means of supporting employees' perceptions and behaviours through a gameful experience (Huotari & Hamari, 2017; Sailer et al., 2017). Eppmann et al. (2018) operationalize gameful experience along six sub-dimensions—enjoyment, absorption, creative thinking, activation, absence of negative affect and dominance. We consider these six sub-dimensions in our research model for two reasons. First, Eppmann et al. (2018) integrate several streams of literature, such as positive emotions through enjoyment (Harwood & Garry, 2015; Rodrigues et al., 2016) or involving properties through absorption (Brockmyer et al., 2009; Hamari et al., 2014; Harwood & Garry, 2015). Second, pre-existing scales in the gaming literature use a question setting more suitable to computer gaming contexts (Brockmyer et al., 2009; Jennett et al., 2008). By contrast, Eppmann et al.'s (2018) scale is appropriate for a workplace and management context. Eppmann et al.'s (2018) multi-dimensional operationalization of gameful experience hence provides the basis for investigating the relationship between game elements, gameful experiences and inter-perception outcomes in the work context. Consequently, observing gameful experience as an intra-perception outcome of the game elements improves our understanding of how gamification influences employees (Landers et al., 2018).

2.4 | The relation between gamified competition and the gameful experience of employees

Following the affordance theory, we argue that gamified competition is a gamification affordance that positively influences the intra-perception of employees' gameful experience. Gibson (2014) postulates that affordances trigger individual emotional states (intra-perception). Therefore, we assume that affordances are a stimulation object that directly influences employees' self-perception. We base our argument on the link between gamified competition and the six sub-dimensions of gameful experience—enjoyment, absorption, creative thinking, activation, absence of negative affect and dominance (Eppmann et al., 2018).

First, gamified competition at the workplace, such as a team ranking, stimulates employees' active perception of success and increases self-esteem, which generates positive emotions, such as enjoyment (Deci & Ryan, 2000). Second, gamified competition leads to an absence of negative affect in the workplace and a positive intra-perception. Gamified competition thus serves as a stimulus activating and motivating employees' perceptual impulse, such as gameful experience—an argument supported by studies on competition (Koivisto & Hamari, 2019; Patrício et al., 2018). Third, gamified competition as a game element suggests that employees become better at engaging with their own and their team's performance. In particular, gamified competition creates transparency about individual and team performance and successes, which enhances employees' ability to compare and rank achievements. This, in turn, positively influences the feeling of dominance because employees can manage and evaluate their own performance (Leclercq, Poncin, & Hammedi, 2020; Suh, 2015), which positively relates to gameful experience. Fourth, competition and clear goals provide prompt feedback, which enables employees to focus on and become absorbed in their core activities (Przybylski et al., 2010; Suh et al., 2017)—which again instils a gameful experience. Fifth, personal comparison with other teams fosters immersion in a game (absorption) and offers employees an incentive for creative thinking, which enhances the gameful experience (Korhonen et al., 2009). Drawing on affordance theory, we argue that gamified competition is positively related to the intra-perception of employees' gameful experience and hypothesize:

> **Hypothesis 2.** Gamified competition is positively associated with employees' gameful experience.

2.5 | The relation between gameful experience and perceived innovation culture

Landers et al. (2018) emphasize that one can understand individual employees' perceptions of game elements not only as outcomes but also as variable explaining employees' perceptions of their work environment. Within the conceptual extension of the two perceptual dimensions (intra-perception and inter-perception) of the foundation of affordance theory, we argue that gameful experience has a positive relationship with employees' perceived innovation culture. Specifically, we postulate that gameful experience is an intra-perception explaining the emergence of inter-perceptions, such as perceived innovation culture.

Following affordance theory, the psychological inter-perceptions of the self act as a stimulus that triggers intra-perceptions of the environment in which the individual perceives the stimulus (Gibson, 2014). Put differently, the personal experience of the gamified application constitutes an intra-perception, which positively relates to an employee's inter-perception of the environment. Accordingly, we argue that gameful experience (intra-perception) has a positive relationship with perceived innovation culture (inter-perception),

which is characterized by the perception of creativity, dynamism, entrepreneurship and adaptability (Chang & Lin, 2007).

First, we argue that creative thinking, a sub-dimension of gameful experience, has a positive impact, especially on the element of creativity within the perceived innovation culture. Creative thinking favours or encourages creative approaches to solving challenges in innovative ways (Martins & Terblanche, 2003). Patrício et al. (2018), for example, show that creative thinking leads to original ideas and prototypes fostering creativity and dynamism—which, in turn, fuel perceived innovation culture. Second, gameful experience also positively influences company dynamism, with employees becoming absorbed in their activities and working rigorously and dynamically towards uncovering innovative solutions. Third, the gameful experience's sub-dimensions of enjoyment and activation advance employees' perception of shared values. These sub-dimensions also foster employees' perception of entrepreneurship, an element of innovation culture, because employees assume they can co-create and shape their company culture. Fourth, consequently, gameful experience also positively influences adaptability, as another element of innovation culture. Overall, the gameful experience in the workplace is personal and resonates emotionally, which promotes the perceived culture of innovation. Employees' own gameful experience positively affects their interpretation of, for example, values and norms or their perception of creativity and dynamism (Bayhan & Korkmaz, 2021; Szczepańska-Woszczyna, 2014), which stimulates employees' intra-perception of corporate innovation culture. Accordingly, we hypothesize:

> **Hypothesis 3.** Gameful experience is positively associated with employees' perceived innovation culture.

2.6 | The role of gameful experience as a mediator

Gameful experience is a construct that acts both as a direct outcome of the game elements and as a mediator variable for further outcomes, which are indirectly influenced by game elements. On the basis of the theoretical framework for the relationships between gamified competition and the intra-perception of gameful experience (H2) and between gameful experience and the inter-perception of an innovation culture (H3), we suggest that gameful experience mediates the relationship between gamified competition and perceived innovation culture.

In line with affordance theory, we argue that affordance positively influences intra-perceptions (individuals' experiences and self-perception such as gameful experience). Intra-perceptions are sparked by a stimulus object (i.e., a game element such as gamified competition) but at the same time also act as a trigger that influences how individuals perceive their environment (inter-perceptions). We thus argue that intra-perception is related to inter-perception (Gibson, 2014). Transferred to our research model, we operationalize intra-perception through gameful experience and inter-perception through perceived innovation culture. We contend that the game element of gamified competition is the stimulus object, which is positively related to gameful experience, which acts as a trigger to individuals' perception of their environment and thus, in turn, is positively related to perceived innovation culture. In other words, the mediating variable of gameful experience explains the relationship between gamified competition as a game element and perceived innovation culture. We postulate: Gamified competition is an affordance that results in employees' gameful experience. This gameful experience, in turn, stimulates employees' perception of an innovative culture.

Extant literature supports our assumption by providing initial evidence that some of the sub-dimensions of gameful experience mediate outcomes (Landers et al., 2018). Witt et al. (2011), for example, analyse enjoyment and activation as mediating variables in the relationship between the gamified competition and idea generation. Helmefalk (2019) examines psychological mediators, such as enjoyment, involvement, or motivation and their association with different types of outcomes. In line with affordance theory and on the basis of the findings of earlier studies on the sub-dimensions of gameful experience, we propose that gameful experience acts as a positive mediator between the game element of gamified competition and perceived innovation culture. We thus hypothesize:

> **Hypothesis 4.** Gameful experience mediates the positive association between gamified competition and perceived innovation culture.

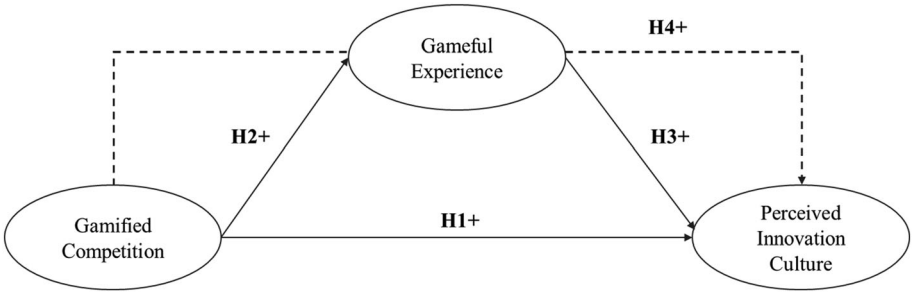

FIGURE 1 Research model.

We depict the above developed hypotheses in Figure 1. The research model of this study is based on the affordance theory and the conceptual extension of perception dimensions. It aims to examine the relationship between gamified competition and perceived innovation culture (inter-perception) as well as the mediating role of employees' gameful experience (intra-perception).

3 | METHODOLOGY

3.1 | Data collection and sample

We collected our data from seven national credit institutions in Germany that use the gameful application to increase sales activities. The application incorporates clear team definitions, often based on the branch structure. It also offers a concise scoring of sales activities, from the inception of a sales idea to its execution. For example, one point is awarded for contacting a customer; another two points are awarded if the customer keeps an appointment; another seven points are awarded if certain consulting tools are used; and nine or even more points are awarded for each contract concluded. The sales activities scorings of the individual teams result in a team league ranking that is transparently communicated institution-wide and on a weekly basis. Teams can track the weekly results and move up or down in the ranking, which creates gamified competition among the individual teams.

To survey our sample regarding the effect of gamified competition on perceived innovation culture in relation to gameful experience, we developed a questionnaire based on established measures. We emailed an online link to the questionnaire to the contact persons of the credit institutions. The contact person forwarded the link to all employees who use the sales application and informed potential respondents that participation in the study was voluntary and that their responses would remain confidential and anonymous. The survey link was open from November 2020 to February 2021. We received 535 responses, which we screened for missing data and completion time, indicating unengaged responses (Newman, 2003). Having adjusted the data, we obtained a final dataset of 382 responses. Table 1 contains the descriptive statistics of the overall sample composition.

3.2 | Measurement

We base the model on established constructs from previous studies that we adapted to the context of gamification. As our sample consisted of German-speaking respondents, we translated all constructs from English into German. We asked credit industry experts to assess our constructs' phrasing in terms of comprehensibility. We then asked academics to evaluate the constructs to ensure that we adapted and translated the measures in a reasonable way. Industry experts and academics indicated no need for changes in our measures. We measure all constructs on a 7-point Likert scale (from 1 = 'strongly disagree' to 7 = 'strongly agree'). Appendix A contains all questionnaire items.

3.2.1 | Gamified competition as independent variable

We measure gamified competition based on a four-item scale by Suh et al. (2017), which the authors adapted from the scale by Lee and

TABLE 1 Overall composition of the sample.

Work experience Years	%	Gender	Education	%
<1	0.8	Female	Associate	77.7
1–2	2.9	Male	Bachelor's	17.3
2–4	7.3		Master's	4.7
4–6	9.4		Doctoral	0.3
6–8	6.5			
8–10	21.5			
>10	51.6			
Duration of participation in the gamified application **Years**	**%**			
<1	10.7			
1–2	13.1			
2–3	19.6			
3–4	28.3			
>4	28.3			

Note: The sample comprises 382 observations.

Yang (2011). Given that gamified competition occurs between teams, research (e.g., Lee & Yang, 2011; Suh et al. (2017) has so far mainly explored the team level. In contrast, we investigate the perceptions of individual team members in settings with gamified competition. Therefore, we have adjusted the items to the team member level. Sample items are as follows: 'The application offers me the possibility to compete with other teams'; 'The application offers me the possibility to compare my performance with that of other teams'.

3.2.2 | Perceived innovation culture as dependent variable

Following Uzkurt et al. (2013), we measure perceived innovation culture with a construct extracted from a sub-scale by Chang and Lin (2007), which is used to assess organizational culture. We slightly adapted the items to measure the individual's perceived innovation culture. Sample items are as follows: 'I perceive my management's commitment to innovation and risk-taking'; 'I perceive that the manager has vision and insight to create new business opportunities'.

3.2.3 | Gameful experience as mediating variable

We measure gameful experience with the gameful experience (GAMEX) scale by Eppmann et al. (2018) and slightly adapt it to fit our context. The scale comprises six sub-dimensions: enjoyment, absorption, creative thinking, activation, absence of negative affect and dominance. Sample items include the following: 'I enjoyed participating in the gamified application/the game very much' (enjoyment); 'I forgot about my immediate surroundings while participating in the gamified application' (absorption); 'While participating in the gamified application, I felt creative' (creative thinking); 'While participating in the gamified application, I felt activated' (activation); 'While participating in the gamified application, I felt frustrated' (absence of negative affect); 'While participating in the gamified application, I felt dominant/I had the feeling of being in charge' (dominance).

3.2.4 | Control variables

We draw our control variables from previous research on gamified applications that suggests possible influences of work experience or gender (Koivisto & Hamari, 2019; Wolf et al., 2020). In addition, we include the duration of participation in the gamified application as control variable to rule out the possible short-term effects of gamified competition mechanisms after their introduction (Leclercq, Poncin, & Hammedi, 2020).

3.3 | Method

Before estimating our hypotheses, we assess the reliability and validity of the measurements using a stepwise approach to ensure the consistency of our research model.

First, we conduct an exploratory factor analysis (EFA) using a promax rotation in SPSS 27 to show the convergent validity of our constructs. We use items with a unique factor loading above .40 for the constructs (Ford et al., 1986) and, consequently, remove eight items due to cross-loadings or low factor loadings, as shown in Appendix A. Second, we perform Bartlett's test using the Kaiser–Meyer–Olkin (KMO) score as a reference (Cerny & Kaiser, 1977). The results of the sample adequacy test confirm the suitability of the data, as the p value is below .05 and the KMO value is above .8 (KMO = .920; p = .000). Third, we test the constructs for thresholds of Cronbach's alpha (α; ≥.7) (Nunnally, 1978), composite reliability (CR; ≥.6) (Bagozzi & Yi, 1988) and average variance extracted (AVE; ≥.5) (Bagozzi & Yi, 1988; Fornell & Larcker, 1981). Table 2 shows that our constructs all meet the appropriate thresholds. Furthermore, the square root of AVE is greater than the bivariate correlation in all cases (Table 3), confirming discriminant validity (Fornell & Larcker, 1981).

Last, using AMOS 27, we conduct a confirmatory factor analysis (CFA) on the overall fit between data and model. The indicators chi-square (χ^2 = 972.266), degrees of freedom (df = 377), minimum discrepancy (χ^2/df = 2.579), comparative fit index (CFI = .929), Tucker–Lewis

TABLE 2 Validity and reliability indicators.

	Number of items	Cronbach's alpha	AVE	CR
GAMEX creative thinking	3	.91	.77	.91
GAMEX activation	3	.89	.74	.90
GAMEX absence of negative affect	4	.86	.62	.86
GAMEX dominance	3	.87	.70	.87
GAMEX absorption	6	.89	.60	.90
GAMEX enjoyment	3	.94	.84	.94
Perceived innovation culture	4	.83	.57	.84
Gamified competition	4	.82	.53	.81

Abbreviations: AVE, average variance extracted; CR, composite reliability; GAMEX, gameful experience scale.

TABLE 3 Correlation matrix.

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
(1) GAMEX creative thinking	**.88**							
(2) GAMEX activation	.86	**.86**						
(3) GAMEX absence of negative affect	.23	.15	**.79**					
(4) GAMEX dominance	.77	.75	.22	**.84**				
(5) GAMEX absorption	.64	.57	.20	.55	**.78**			
(6) GAMEX enjoyment	.83	.83	.23	.66	.60	**.92**		
(7) Perceived innovation culture	.42	.43	.01	.31	.19	.33	**.76**	
(8) Gamified competition	.58	.67	.18	.57	.35	.59	.39	**.73**

Note: The square root of the average variance extracted is shown in the diagonal.
Abbreviation: GAMEX, gameful experience scale.

index (TLI = .918) and root-mean-square error of approximation (RMSEA = .064) have reasonable values, showing that the model fits the data well (Browne & Cudeck, 1992; Hair et al., 2006; Schermelleh-Engel et al., 2003).

3.4 | Assessing potential biases

We take several procedural and statistical steps to reduce the risk of potential biases and mitigate concerns regarding common method bias (Podsakoff et al., 2003). First, to account for common-method bias, we in eliminated ambiguities in the wording and clarified potential comprehension issues the early phase of developing the questionnaire. Second, we assured the participants of anonymity, emphasizing that there are no 'right' or 'wrong' answers. Third, we separated independent and dependent variables within the questionnaire (Podsakoff et al., 2003). Fourth, we compare early responses with late responses (Armstrong & Overton, 1977), which results in no significant differences. We thus consider a non-response bias unproblematic or unlikely for the survey. Fifth, we perform Harman's single factor test and find no evidence of data structure bias (Podsakoff et al., 2003). Sixth, we use a marker variable (preference for the colour blue; Johnson et al., 2011) that is unrelated to all our constructs (Simmering et al., 2015) and test the correlations with and without the marker variable. Comparing the results reveals no change in coefficients or significance levels, which suggests that common method bias does not unduly affect our data (Lindell & Whitney, 2001). Seventh, with the use of a χ^2-difference test, we compare the different models with the marker variable (Williams et al., 2010), as shown in Table 4, and again find no indication of a common method bias. In summary, common method bias does not seem to affect the results of the study.

TABLE 4 Model comparison test with the marker variable based on Williams et al. (2010).

Model	χ^2	df	CFI
1. CFA	1001	458	.938
2. Baseline	1011	472	.939
3. Method-C	1006	471	.939
4. Method-U	968	442	.940
5. Method-R	968	470	.944
χ^2-model comparison tests	**$\Delta\chi^2$**	**Δ df**	**χ^2 critical value: .05**
1. Baseline vs. Method-C	5	1	3.84
2. Method-C vs. Method-U	38	29	30.14
3. Method-U vs. Method-R	0	28	7.82

Abbreviations: CFA, confirmatory factor analysis; CFI, comparative fit index; df, degrees of freedom.

4 | RESULTS

4.1 | Hypotheses testing

We evaluate the hypothesized relationships within our research model by employing structural equation modelling (SEM). This approach enabled us to investigate the direct effects examined in Hypotheses 1–3 and the indirect effect examined in Hypothesis 4.

Regarding the direct effects, H1 states that gamified competition is positively associated with perceived innovation culture. The results of the SEM analysis are displayed in Table 5; they show that this direct effect is positive and significant ($\beta = .399$; $p = .000$), supporting H1.

H2 proposes that gamified competition is positively associated with the gameful experience of employees. The results of the SEM analysis are displayed in Table 6; they show that this direct effect is positive and significant ($\beta = .715$; $p = .000$), supporting H2.

H3 proposes that gameful experience is positively associated with the innovation culture employees perceive. The results presented in Table 6 show that this direct effect is positive and significant ($\beta = .316$; $p = .000$), supporting H3.

Prior to analysing the indirect effect hypothesized in H4, we conduct a comparative analysis of the model fit values of one model excluding the mediator (Model 1) and one model including the mediator (Model 2); we find that the inclusion of gameful experience as mediator improves the model fit. This result suggests the relevance of gameful experience as explaining variable in our model (Model 1: $\chi^2/df = 2.596$; RMSEA = .065; CFI = .959; TLI = .938; IFI = .959; Model 2: $\chi^2/df = 1.787$; RMSEA = .045; CFI = .957; TLI = .951;

TABLE 5 Structural equation modelling without the mediating variable—Model 1.

Hypotheses testing	Std. Est.	SE	CR	p^{***}
Main effects				
COMP → PIC	.399	.085	4.712	.000***
Controls				
Work experience → PIC	.001	.047	.022	.982
Gender → PIC	.238	.135	1.762	.078
DURA → PIC	.054	.053	−1.021	.307

Abbreviations: CR, critical ratio; COMP, gamified competition; DURA, duration of participation in the gamified application; PIC, perceived innovation culture; SE, standard error; Std. Est., standardized estimate.
*p < .05, **p < .01, and ***p < .001.

TABLE 6 Structural equation modelling including the mediating variable—Model 2.

Hypotheses testing	Std. Est.	SE	CR	p^{***}
Main effects				
COMP → PIC	.140	.083	1.674	.094
COMP → GAMEX	.715	.080	8.941	.000***
GAMEX → PIC	.316	.069	4.584	.000***
Controls				
Work experience → PIC	.008	.045	.174	.862
Gender → PIC	.243	.129	1.894	.058
DURA → PIC	−.055	.051	−1.077	.281

Abbreviations: CR, critical ratio; COMP, gamified competition; DURA, duration of participation in the gamified application; GAMEX, gameful experience scale; PIC, perceived innovation culture; SE, standard error; Std. Est., standardized estimate.
*p < .05, **p < .01, and ***p < .001.

IFI = .957). In both models, the included control variables of work experience, gender and duration of participation in the gamified application are not significant, as shown in Tables 5 and 6.

To estimate the indirect effect hypothesized in H4, we follow the approach by Baron and Kenny (1986) to examine the mediation effect of gameful experience. The authors state that for a mediation effect to occur, the following criteria need to be met: (a) The independent variable is related to the dependent variable, (b) the independent variable is related to the mediating variable, (c) the mediating variable is related to the dependent variable and (d) when including the mediating variable, a previously significant direct relation between the independent and dependent variables is no longer significant, implying full mediation. H4 proposes that gameful experience mediates the positive relationship between gamified competition and perceived innovation culture. Given that we find support for Hypotheses 1–3, we meet the first three criteria (a–c). For the fourth criterion (d), our results show that the direct relationship between gamified competition and perceived innovation culture is no longer significant when including the mediating variable of gameful experience ($\beta = .140$; $p = .094$). We conclude that gameful experience fully mediates the relationship between gamified competition and perceived innovation culture (Baron & Kenny, 1986), supporting H4. In addition, we follow Zhao et al. (2010), who suggest using the bootstrapping approach by Preacher and Hayes (2008) with bias-corrected confidence intervals to identify the indirect effect. We report results in Table 7. With these results, we find further support that the indirect effect is positive and significant (indirect effect: .226, $p = .006$); thus, gameful experience significantly mediates the relationship between gamified competition and perceived innovation culture, further supporting H4.

5 | DISCUSSION

We investigate the effect of gamification on employees' intra- and inter-perceptions and find that the intra-perception of gameful experience fully explains the relationship between gamified competition as stimulus and the inter-perception of perceived innovation culture. In other words, our results suggest that employees need to feel a gameful experience for the gamified competition to trigger the perception of innovation culture.

Our study advances the gamification literature in three ways. First, we explain that the gameful experience plays a central role in the implementation of gamification elements. While previous studies

TABLE 7 Bootstrapping results.

Hypothesis testing	Indirect effect	SE	p^{***}	LLCI	ULCI
COMP → GAMEX → PIC	.226	.055	.006**	.150	.345

Note: Bias-corrected bootstrapping analysis with 5000 resamples at a 95% confidence interval. The indirect effect was estimated using the unstandardized coefficient.
Abbreviations: COMP, gamified competition; GAMEX, gameful experience scale; LLCI, lower-level confidence interval; PIC, perceived innovation culture; SE, standard error; ULCI, upper-level confidence interval.
*p < .05, **p < .01, and ***p < .001.

find positive and negative effects of gamified competition on employees' perceptions (e.g., Sailer & Homner, 2020; Song et al., 2013), our study highlights that employees' experience is the mechanism underlying the achievement of positive perceptions of company culture when implementing gamified competition. Elements of gamified competition that deliver a gameful experience are, for example, leaderboards that help employees view others' contributions and that encourage friendly, constructive competition resulting in joy, feelings of relatedness and intrinsic motivation (Rigby & Ryan, 2011; Suh & Wagner, 2017). As such, gamified competition should be designed to promote cooperation and social support and improve each team member's skills rather than teach them to defeat someone (Sailer & Homner, 2020). Moreover, elements such as celebrating winners or providing autonomy to develop individual competition strategies are positively related to hedonic values (Deci & Ryan, 2000; Suh & Wagner, 2017) and thus foster a gameful experience. By showing that gameful experience explains the relationship between gamified competition and employees' perception of innovation culture, our findings help clarify previous controversies in the literature related to gamified competition. We find support for those studies that view gamified competition as beneficial, such as Suh and Wagner (2017), who show that gamified competition is positively related to employees' perceived hedonic value. Our findings imply that it is not the mere introduction of gamified competition into the work setting that changes employees' company perception (inter-perception)—instead, it is the intra-perception of gameful experience that acts as a stimulus. By responding to calls to study mediator variables (Landers et al., 2018), we enhance the current understanding of how game elements, such as gamified competition, lead to beneficial outcomes (Koivisto & Hamari, 2019; Liu et al., 2017). Moreover, previous studies often include only one dimension, either intra- or inter-perception, when investigating the effect of game elements (Koivisto & Hamari, 2019). Our results underline the need to include both dimensions to understand the essential role intra-perceptions play in explaining how inter-perceptions emerge when triggered by a stimulus object. Our work supports earlier studies that emphasize the individual inter-perception of the game experience as an important research aspect of gamification (Eisingerich et al., 2019; Eppmann et al., 2018; Leclercq, Poncin, & Hammedi, 2020; Liu et al., 2017; Wolf et al., 2020). In addition, by investigating gamified competition, our study explores a positive antecedent of the construct of gameful experience, thereby expanding the nomological network and providing the starting point for further research on gamification, as called for by Eppmann et al. (2018).

Interestingly, none of the included control variables is significant in our models, even though previous research highlighted the positive effect of experience and the diminishing effect of gender on commitment to use and refer a game application (Wolf et al., 2020). Moreover, research shows that the duration of a game element's use negatively relates to the game element's perceived hedonic and enjoyable aspects because participants' curiosity and the sense of novelty decrease (Magni et al., 2010). A potential explanation of the non-significant control variables in our model is that their influence is susceptible to the specific context. For example, Wolf et al. (2020) investigate gamified services surveying customers; Magni et al. (2010) investigate MBA students. We, in contrast, investigate service employees in the work environment of credit institutes who face repetitive work routines, bureaucratic tasks and standardized processes. These employees, it seems, perceive the introduction of a game element in the form of gamified competition as a welcome distraction that requires them to engage in creative processes and teamwork, which their daily work routines would otherwise not entail. As a result, the game element fosters a joyful, fun and playful experience and a perceived innovation culture irrespective of gender, prior work experience or duration of participating in the game application. Whereas research shows that exposure to a stimulating application decreases users' enjoyment over time (Sevilla & Redden, 2014), our results suggest that it is likely for employees to become satiated less quickly when utilizing a game application in contexts characterized by repetitive and standardized tasks. Nevertheless, future research is needed to verify these suggestions.

Second, we advance the literature on gamification research by examining individual perceptions of corporate innovation culture as an outcome in the workplace. Our findings show that within the context of our study, gameful experience has a positive influence on the perception of innovation culture over and above the direct influence of gamified competition. With this, we extend the affordance theory by highlighting that affordance triggers individual emotional states (intra-perception) but does not directly influence how individuals perceive the environment in which the stimulus occurs—in our context, how they perceive their companies' innovation culture (inter-perception). We conclude that analysing employee perceptions yields valuable insights—in addition to the aspects explored by previous researchers, for example, organizational factors like corporate

structure, support mechanisms and communication (Dombrowski et al., 2007; Martins & Terblanche, 2003). By considering the culture of innovation as part of the corporate culture, we follow Chang and Lin (2007) and scrutinize a perspective characterized by creativity, entrepreneurship, adaptability and dynamism. Our results show that the impact of gamification unfolds through gameful experience, thereby affecting the perceived level of creativity, entrepreneurship, adaptability and dynamism, and, thus, the innovation culture employees perceive. This finding is relevant, given that innovation is a key factor contributing to competitiveness and the prevention of obsolete processes in a company (Movaghar et al., 2021; Villaluz & Hechanova, 2019).

Third, the selection of our research context advances the gamification literature. We transfer the construct of gameful experience, originally applied to customers in an online context (Eppmann et al., 2018), to the perspective of employees who use gamification applications in the workplace. Responding to Eppmann et al. (2018), we apply the construct in a different context, generalizing the scale for a gamified application in the workplace. Furthermore, gamification research has so far largely focused on the contexts of education, learning and health (Koivisto & Hamari, 2019; Seaborn & Fels, 2015). Although there are a few studies on gamification in the management context (e.g., Mekler et al., 2017; Stanculescu et al., 2016), these studies do not focus on the gameful experience and perceptions of employees in the workplace. Thus, our study fills an important gap, as we highlight gamification as a meaningful antecedent to perceived corporate innovation culture and shed light on the theoretical relationship between game application and employees in the workplace.

5.1 | Limitations and opportunities for future research

This study provides several opportunities for future studies to develop the research stream exploring employees' gameful experience in the workplace. We examine the relationship between gamified competition as a game element, gameful experience and perceived innovation culture in the company. Focusing on gamified competition within the workplace, we investigated a central but single game element. We encourage future studies to foreground other pivotal game elements to explore the antecedents of gameful experience and its mediating effect on outcomes. Moreover, we investigate the individual level of employees. While we establish that following affordance theory, gamified competition stimulates both intra- and inter-perception, we acknowledge that our results do not necessarily directly translate to the team level: Individuals' responses to gamification are not necessarily identical to the responses of individuals gaming in teams. We thus call for future studies to explore in detail the gameful experience of teams in a workplace setting, which entails team rankings and competition.

We are among the first to investigate two different perceptions as outcomes of game elements: By investigating gameful experience, we examine employees' intra-perception, and by assessing perceived innovation culture, we ascertain their inter-perception. We call for research to enhance our current understanding of the relationships among employees' experience, game elements and perceptual perspectives in the context of gamification research and to investigate further inter-perception outcomes related to gameful experience. While we explain the relation of gamification with a positive inter-perception, we call on future research to also explore the 'dark side of gamification', as gamification might be perceived by employees as a disguised control mechanism, resulting in disengagement or poorer performance (Hammedi et al., 2021, p. 256).

Lastly, we need further research on the role of gameful experience in the management and workplace context. Our data originate in credit institutions that use gamification to intensify sales activities in the workplace. The credit industry is known for less creative processes compared with, for example, the marketing sector. It might be interesting to investigate how game elements drive perceived innovation culture in more creative settings. Future research could examine companies in other fields to establish in how far our findings are generalizable. In particular, the type of work and the way it is perceived could provide further insights. We call on researchers to look more closely at the management context, use of competition at the workplace and other contexts to substantiate the findings of this study.

5.2 | Practical implications

This study provides important insights for management with regard to a successful and sustainable implementation of gamification. We suggest that managements consider introducing gamified competition to foster the perceived culture of innovation within their company, which improves employee performance (Jiménez-Jiménez & Sanz-Valle, 2011; Movaghar et al., 2021).

We highlight three recommendations to managers: First, our results inform managers of the positive relationship between gamified competition and perceived culture, fully mediated by gameful experience. Put differently, the mere technical introduction of game elements, such as gamified competition, by management does not directly lead to employees perceiving a stronger innovation culture; rather, their gameful experience is the key to the positive relationship. Managements should thus focus on evoking positive gameful employee experiences when implementing the gamified competition to achieve the best possible success. To do so, we advise managers to, for example, define clear challenges and rules as part of the gamified competition. Such a framework enables employees to understand what they need to achieve and how their progress will be measured, creating a sense of purpose and engagement. Likewise, rewards of the gamified competition should be communicated transparently and be perceived as valuable by employees. These rewards can be extrinsic, such as bonuses, or intrinsic, such as status, progression and personal growth opportunities (Gimenez-Fernandez et al., 2021). Moreover, managers could give immediate feedback to

employees not only for the completion of a game element but also for the quality of contributions, which fosters deliberate, playful and enjoyable experiences (Patrício et al., 2018). Similarly, adding information to the game element that is meaningful to the employees, such as disclosing the overall objective of the gamified competition, helps managers achieve a gameful experience (Bekk et al., 2022; Hammedi et al., 2021). Managers could also stress the social character elements of gamified competition by implementing discussion forums to enable team-internal collaboration. This approach fosters a sense of being needed or of belonging to a team, which employees experience positively (Patrício et al., 2018). Importantly, Hammedi et al. (2021, p. 266) stress that 'when a gamified activity is mandatory, it loses its entertaining and fun value'; therefore, managers should implement gamified competition as a voluntary activity.

Second, we recommend that managers customize the gamification approach carefully to their specific company context. In our study, we investigated national credit institutions that use the gameful application to increase sales activities and transparently communicate a league ranking on a weekly basis. As gamified applications can be tailored to specific requirements (Gimenez-Fernandez et al., 2021), we suggest that managers, for example, adjust the communication intervals of the ranking or the team combinations to their specific context. This can improve employees' perception of the company, for example, in terms of innovation culture. Hammedi et al. (2021, p. 266) accordingly state that 'managers must be careful about the blind use or broad implementation of gamified technologies. Even if they appear trendy, to be effective, they must fit with and be embodied in the company's overall culture and strategy'.

Third, we investigate the effects of gamified competition and gameful experience on the positive inter-perception of perceived innovation culture. However, if not adopted carefully, gamification can also lead to negative outcomes, such as reducing employees' well-being (Hammedi et al., 2021), which inhibits employees' creativity and innovation processes (e.g., Huhtala & Parzefall, 2007; Roskes, 2015) and potentially affects their perception of the company culture. Managers thus need to be aware of the possible downsides of gamification and include meaningful information or disclose the distraction potential of game elements, as these design elements help avoid the potentially detrimental effects of gamification (Bekk et al., 2022).

Overall, our findings reveal a positive relationship between gamified competition and employee perceptions (inter-perception and intra-perception), thereby supporting decision-making in companies that aim to foster a creative, innovative and dynamic culture by implementing gamification. We hope our insights help companies manage employee perceptions—particularly regarding corporate innovation culture—with a gamification approach and in a targeted way.

6 | CONCLUSION

Based on the affordance theory, this study investigates the role of employee perceptions in gamified applications by exploring the relationship between gamified competition as a game element and intra- and inter-perceptions. Our results highlight how essential gameful experience is in explaining the link between game elements and perceived innovation culture. We add to gamification research and the affordance theory by taking a first step towards uncovering that game elements stimulate employees' intra-perception, which, in turn, stimulates their inter-perception of corporate innovation culture. We hope that our study inspires future researchers to develop an even better understanding of gamification in the workplace.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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APPENDIX A

Items and factor loadings	Factor loadings
GAMEX sub-dimension enjoyment	
Playing the game was fun.	A
I liked playing the game.	.86
I enjoyed playing the game very much.	.84
My game experience was pleasurable.	.95
I think playing the game is very entertaining.	A
I would play this game for its own sake, not only when being asked to.	A
GAMEX sub-dimension absorption	
Playing the game made me forget where I am.	.82
I forgot about my immediate surroundings while I played the game.	.92
After playing the game, I felt like I was coming back to the "real world" after a journey.	.88
Playing the game "got me away from it all."	.67
While playing the game, I was completely oblivious to everything around me.	.67
While playing the game, I lost track of time.	.59
GAMEX sub-dimension creative thinking	
Playing the game sparked my imagination.	.80
While playing the game, I felt creative.	.89
While playing the game, I felt that I could explore things.	.48
While playing the game, I felt adventurous.	A
GAMEX sub-dimension activation	
While playing the game, I felt activated.	A
While playing the game, I felt jittery.	.91
While playing the game, I felt frenzied.	.51
While playing the game, I felt excited.	.73
GAMEX sub-dimension absence of negative affect	
While playing the game, I felt upset.	.71
While playing the game, I felt hostile.	.56
While playing the game, I felt frustrated.	.91
While playing, I felt disappointed.	.93
GAMEX sub-dimension dominance	
While playing the game, I felt dominant/I had the feeling of being in charge.	.69
While playing the game, I felt influential.	.96
While playing the game, I felt autonomous.	.81
While playing the game, I felt confident.	A
Perceived innovation culture	
I perceive my management's commitment to innovation and risk-taking.	.95
I perceive that my managers are actively leading employees towards growth and innovation.	A
I perceive that the manager has vision and insight to create new business opportunities.	.97
I perceive that I can always face challenges to learn and grow from them.	.54
My company pays attention to the uniqueness of employees and encourages innovation from employees.	.47
My company is willing to take risks, and it is indeed an ambitious and energetic organization.	A
Gamified competition	
The application offers me the possibility to:	
… compete with other teams.	.90

Items and factor loadings	Factor loadings
… compare my performance with that of other teams.	.97
… threaten the status of other teams by my active participation.	.54
… achieve higher team rankings through my active participation.	.47

Note: Maximum likelihood analysis; promax rotated.
Abbreviations: A, Item excluded from final analysis due to low factor loadings or cross-loadings; GAMEX, gameful experience scale.