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## RESEARCH ARTICLE

# Unlocking novel opportunities: How online ideation platforms implicitly guide employees toward better ideas by spurring their desire to innovate

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Employees' innovative behaviour becomes increasingly important for organizational success. Companies try to improve their innovation capabilities by supporting and motivating employees to show innovative behaviour. Particularly online ideation platforms become relevant because they create new opportunities for employees to be innovative. This paper investigates how exposure to online ideation platforms' unique capabilities stimulates intrinsic motivation toward innovative behaviour and ultimately the submission of high-quality ideas. Based on expectancy and channel expansion theories, we derive a framework with four intrinsic motivational forces that online ideation platforms can stimulate. A two-study approach empirically tests this framework. The first study uses a multilevel regression on a dataset of 1630 employees nested in 136 departments of a leading international science and technology company. The second study analyses how 279 employees of the same company, who submitted 678 ideas on the company's online ideation platform, continue to be motivated by the platform's inherent characteristics and capabilities and submit high-quality ideas. The results support the core argument that online ideation platforms stimulate certain desires motivating employees to engage in innovative behaviour and ultimately submit high-quality ideas. The detailed results offer several contributions to innovation management literature and beyond.

## KEYWORDS

desires, innovative behaviour, motivation, online ideation platforms

## 1 | INTRODUCTION

Motivated individuals excel at daily tasks and often engage in extra-role behaviour, such as innovative behaviour (Zhu et al., 2018). However, organizational barriers, such as an inflexible culture, rigid structures and cumbersome improvement processes, make it hard for employees to change the status quo. As employees' innovative behaviour becomes increasingly important for organizational success, many companies try to change this situation. For example, they

establish support systems, such as online ideation platforms, to stimulate innovative behaviour and provide employees with a platform to express and share their ideas (Beretta, 2019; Ferraris et al., 2019). However, only a fraction of employees uses such platforms because they are too involved in routine tasks and not motivated to use them. They lack motivation because they have not yet experienced the platform and lack insights into how it could support them in achieving their personal goals (Carlson & Zmud, 1999; Vroom, 1964). Employees who use such an ideation platform are

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either motivated strongly enough to push their ideas against all odds or have received extrinsic goals by superiors, such as submitting a certain number of ideas. While the former usually contributes valuable ideas, the latter often only creates crowding, causing ideation platforms to become cluttered with unhelpful ideas (Kruft & Gamber, 2021; Piezunka & Dahlander, 2015). Therefore, companies seek to increase their employees' intrinsic motivation to participate actively on online ideation platforms and further improve the quality of the submitted ideas.

Paradoxically, online ideation platforms should have great potential to support employees' intrinsic motivation to innovate: Platforms enable new ideas to be developed more efficiently and effectively by reducing research effort, connecting more extensive networks faster (Katz & Shapiro, 1985) and providing feedback from around the world (Hwang et al., 2015; Kruft et al., 2019; Piezunka & Dahlander, 2018). But according to channel expansion theory, this effect only applies to those who know about the platform's capabilities and gain experience with it (Carlson & Zmud, 1994; Carlson & Zmud, 1999). Consequently, employees who know the platform and connect its capabilities with their own motives should be motivated to behave innovatively and submit high-quality ideas.

Despite the growing number of studies investigating motivation in ideation platforms, empirical understanding has several gaps. First, the studies come to inconclusive findings; for example, several studies find no significant role of motivation on idea platforms (Benbya & Leidner, 2018; Rode, 2016; Zimmerling et al., 2019), and some even find negative relationships (Mack & Landau, 2015). Second, no previous study delivers a comprehensive view on motivational factors because they either use only a generic construct (Buech et al., 2010; Leung et al., 2014; Mack & Landau, 2015; Zimmerling et al., 2019) or consider only selected aspects of motivation (Bergendahl et al., 2015; Rode, 2016; Smith et al., 2017). Third, studies typically concentrate on participants who already decided to contribute (Kosonen et al., 2014; Mack & Landau, 2015; Rode, 2016). This neglect of nonparticipants provides a potentially biased view. The few studies that consider participants and nonparticipants are qualitative investigations (Benbya & Leidner, 2018; Leung et al., 2014; Muhdi & Boutellier, 2011; Wendelken et al., 2014).

Overall, research on individual motivation on online ideation platforms is fragmented, especially about explaining which factors motivate employees throughout their entire individual innovation process, from showing initiative, engaging in innovative behaviour to ultimately submitting high-quality ideas. This fragmentation is especially true because online ideation platforms strongly affect how organizations and individuals innovate and deal with innovation socially and psychologically (Li, 2020; Rindfleisch et al., 2017). *Therefore, this study's research question is: How can online ideation platforms intrinsically motivate employees to strengthen their innovative behaviour and submit high-quality ideas?*

Vroom's (1964) expectancy theory and Carlson and Zmud's (1994, 1999) channel expansion theory are suitable as the theoretical foundation: The former explains how employees become motivated in general, and the latter explains how exposure to online ideation

platforms unlocks and further strengthens these motivational forces. Both theories are well used but rarely in research on entrepreneurial or innovative behaviour (Mirzaei & Esmailzadeh, 2020; Renko et al., 2012; Van Eerde & Thierry, 1996). Therefore, we conduct an extensive literature review, bridge the remaining gap between the two theories and connect them to the literature on ideation platforms. We test the resulting framework with a two-study approach.

This paper contributes to innovation management literature, specifically the research stream on ideation platforms, by offering a comprehensive and differentiated analysis of innovative behaviour's motivational factors on ideation platforms. Based on expectancy theory, we determine four motivational forces (exploration, competition, transformation and appreciation) that drive innovative behaviour and, eventually, the quality of submitted ideas. Following channel expansion theory, we argue that exposure to the platform increases these motivational factors. In contrast to previous research, we use a two-study approach that includes platform participants and nonparticipants and considers the whole process from initiative to submission of high-quality ideas. The first study investigates how 1630 employees nested in 136 departments of a leading international science and technology company perceive their company's online ideation platform and how this perception increases their motivation to show innovative behaviour. The second study, encompassing 279 employees who submitted 678 ideas on the same company's online ideation platform, analyses how participants continue to be motivated by the online ideation platform's inherent characteristics and submit high-quality ideas.

## 2 | THEORETICAL BACKGROUND

### 2.1 | Motivational antecedents of innovative behaviour and the expectancy theory

Innovative behaviour is an employee's complex extra-role behaviour that pertains to generating, promoting and implementing new ideas (Janssen, 2001; Yuan & Woodman, 2010). The starting point for innovative behaviour consists of problem recognition and individual motivations. Accordingly, Scott and Bruce (1994) see the investigation of motivation mechanisms as an essential study field in innovative behaviour literature. Although prior research thoroughly investigated antecedences of innovative behaviour, considering both individual (Bunce & West, 1995; Janssen & van Yperen, 2004; Scott & Bruce, 1994; Yuan & Woodman, 2010) and organizational factors (Axtell et al., 2000; Basu & Green, 1997; Chandler et al., 2000; De Jong & Kemp, 2003; Engelen et al., 2017; Mumford et al., 2002; Scott & Bruce, 1994; Tierney et al., 1999), research rarely investigated motivational factors as direct antecedents of innovative behaviour (Parker et al., 2006; Tu & Lu, 2013). However, addressing this research gap is important because understanding the underlying psychological dynamics enables organizations to effectively increase their employees' innovative behaviour (Terborg & Miller, 1978). In addition, employee innovative

work behaviour increases the employees' chances of coming up with high-quality ideas because it is seldom the first attempt that succeeds (Terwiesch & Xu, 2008). A central theory explaining the relationship between motivation and innovative behaviour is Vroom's expectancy theory (Fairbank et al., 2003; Vroom, 1964).

Expectancy theory asserts that individuals consider three aspects before deciding to act: *What is the likelihood to achieve a specific performance (expectancy), how will this performance lead to a particular outcome (instrumentality) and is this outcome desirable (valence)?* Multiplying these three components results in the overall motivational force, described as the desire to carry out or avoid a behaviour (Vroom, 1964). The resulting formula is as follows:

$$\text{Overall motivational force} = \sum_{i=1}^m \text{Expectancy} * \underbrace{\text{Valence}_i(\text{Outcome}) * \text{Instrumentality}_i}_{=\text{Valence}_i(\text{Performance})}$$

The index  $i$  numbers the series of motives  $m$ , each of which points toward a corresponding outcome, whose sum constitutes the overall motivational force. Using the example of a competitive employee who takes part in an ideation contest, the outcome valence refers to the employee's desire to succeed, thus getting an idea accepted—the corresponding motive would be competition. To achieve this goal, the employee has to achieve a strong performance, which means to excel in innovative behaviour. Instrumentality describes the employee's assessment of how likely this behaviour will lead to the outcome—an accepted idea. Finally, expectancy describes how confident the employee feels to successfully carry out innovative behaviour. Multiplying these three factors results in the employee's overall motivational force—assuming in this example that the employee only has

competition as motive (i.e.,  $i = m = 1$ ). The desire to succeed (outcome valence) and how likely innovative behaviour will lead to success (instrumentality) can also be subsumed by the term performance valence: How important is the performance (innovative behaviour) to reach the outcome (be successful)?

Participants pursue various goals on an online ideation platform, and idea success is not always, or exclusively, the desired outcome. Accordingly, employees could have more than one motive, for example, meeting challenges, discovering new horizons or contributing to a better world (Reiss & Havercamp, 1998; Vroom, 1964). The desired outcomes employees seek to achieve through innovative work behaviour differ widely between individuals (Reiss, 2004; Van Eerde & Thierry, 1996) and are highly context-dependent (Renko et al., 2012; Vroom, 1964). On the one hand, it is important to use an encompassing concept so that the resultant motivational forces cover reality in the best possible way. On the other hand, the desired outcomes should reflect the context of innovative work behaviour on digital platforms. Using the theory of 16 basic desires (Reiss, 2004), which encompasses the multifaceted nature of intrinsic motivation, as a starting point, we conducted a comprehensive literature review on motivational factors in the context of innovative behaviour (see Table 1). The outcomes converged into four overall motivational factors, comprising 11 of Reiss's (2004) 16 motives, all of which can stimulate innovative behaviour in a company. The five remaining motives (romance, family, order, tranquility and eating) do not directly affect innovative behaviour. For example, if transferable to the concept of making a living, the motive of eating or the desire to avoid hunger may, for instance, influence the founding of a startup (Amit et al., 1995). In the context of a company with solid employment relationships, this factor is likely negligible. Similar to the other four motives, they are not explored further.

**TABLE 1** Desires that may affect innovative behaviour on online ideation platforms

Motivational force	Definition	Subsumed Reiss motives	Literature
Exploration	The desire for new knowledge and social exchange	Curiosity; independence; social contact	Rogers (1954); Franke and Shah (2003); Kashdan et al. (2004); Reiss (2004); Füller et al. (2007); De Jong and Den Hartog (2010); Aalbers et al. (2013); Mack and Landau (2015)
Competition	The desire for challenge and efficacy	Honour; exercise; vengeance	Begley and Boyd (1987); Eisenberger (2003); Hertel et al. (2003); Reiss (2004); Segal et al. (2005); Mack and Landau (2015); (Bergendahl et al., 2015); Hong et al. (2016)
Transformation	The desire for impact and contribution	Idealism; power	Nickerson (1985); Shane et al. (2003); Reiss (2004); Segal et al. (2005); Frey et al. (2011); Renko et al. (2012)
Appreciation	The desire for self-importance and self-confidence	Status; acceptance; saving	Eisenberger and Selbst (1994); Janssen (2000); Hertel et al. (2003); Reiss (2004); Segal et al. (2005); Füller et al. (2007); Yuan and Woodman (2010); Frey et al. (2011); Renko et al. (2012); Mack and Landau (2015)

In addition to these intrinsic motivational forces, employees can be motivated by extrinsic factors as well. However, employees tend to value extrinsic motivations less, while social and personal factors are more relevant for participating on online ideation platforms (Birkinshaw et al., 2011). Recent literature also provides evidence that motivating employees by extrinsic factors can promote unethical, deviant and morally questionable behaviour (Gatzweiler et al., 2017; Scheiner et al., 2018). Also, although extrinsic factors may increase participation, the quality of contributions can suffer significantly (Benbya & Leidner, 2018; Piezunka & Dahlander, 2015; Wendelken et al., 2014). Likewise, Bergendahl et al. (2015) could show that employees with more patents are more intrinsically motivated than those with fewer patents. Therefore, this study's focus lies mainly on the effects of intrinsic motivation.

*Exploration* refers to the desire for new knowledge and social exchange, which includes seeking new opportunities. The knowledge-seeking aspect serves the intellectual stimulation of learning goals and gaining new insights, both by sharing knowledge and searching for professional advice (Füller et al., 2007; Mack & Landau, 2015). Implicit knowledge is especially shared via an interpersonal exchange, for instance, within intra-organizational networks, adding a social dimension to exploration (Aalbers et al., 2013). Franke and Shah (2003) also saw that one reason for participating in innovation activities is the fun and excitement of a mutual exchange, which facilitates knowledge-sharing (Füller et al., 2007).

*Competition* encompasses the desire for challenge and efficacy, representing social comparison motives (Hertel et al., 2003). Individuals with this motive strive for proactive goals with challenging situations, with enthusiasm resulting from these activities compensating for potential setbacks and difficulties (Eisenberger, 2003; Hong et al., 2016). This need for achievement allows them to constantly self-improve (Begley & Boyd, 1987; Segal et al., 2005).

Innovators often feel the need to contribute to a better world. This motive of *transformation* comprises Reiss's desires for independence, honour and idealism (Reiss, 2004). Individuals with these desires are primarily concerned with establishing meaningful activities that serve high purposes (Eisenberger, 2003; Nickerson, 1985). The focus is always on the impact individuals can achieve through their actions (Segal et al., 2005), conveying an intrinsic enjoyment of contributing (Frey et al., 2011).

Rewards can be material, such as income potential or financial security (Segal et al., 2005), or social and have reputational effects, such as attention and approval (Füller et al., 2007; Reiss, 2004). Both reward types affect individuals' perceived self-confidence or self-importance (Reiss, 2004), key aspects of the motive *appreciation*. An individual's perception by others is particularly important because it addresses not only central desires but, through reputational gains, also opens opportunities to access important resources and social support for achieving this individual's goals (Füller et al., 2007; Hertel et al., 2003; Yuan & Woodman, 2010). Striving for status and rewards may initially appear to be a purely extrinsic desire, as the personal benefits do not directly relate to the activity itself. However, such desires are also partly intrinsic, since building a reputation in a

community creates "feelings of worth and self-esteem, so that the process of performing the task leads to sensations of enjoyment and satisfaction" (Frey et al., 2011: 402).

## 2.2 | Motivation related to online ideation platforms and the channel expansion theory

Research on digital platforms dates back a long way and essentially concerns bringing together users and contributors to achieve the goals set out by the platform (McIntyre & Srinivasan, 2017). Since platforms thrive on their participants, their motivation is essential, which—especially on two-sided platforms—poses complex challenges manifoldly discussed in the literature (Caillaud & Jullien, 2003). Research has identified several strategies to ensure the successful establishment and use of digital platforms (Trabucchi et al., 2021; Trischler et al., 2021).

Regarding digital ideation platforms, online ideation platforms allow individuals to connect with each other and form communities that enable them to share their knowledge, ideas, assumptions and beliefs, helping the community as a whole to grow and to develop and evolve new ideas (Björk & Magnusson, 2009; Kruff et al., 2019; Spender, 1996). If the company explicitly demands the development of such ideas, online ideation platforms are often referred to as crowdsourcing platforms, performing tasks originally done by specific departments (Bayus, 2013). From a company's perspective, online ideation platforms can further be distinguished between closed setups only accessible to employees and open setups also accessible to everyone outside the company (Björk & Magnusson, 2009; Bugshan, 2015). Online ideation platforms accessible to the general public are also called open innovation platforms (Hossain & Islam, 2015; Troise et al., 2021).

Current literature of online ideation platforms focuses on platforms that host ideation contests or crowdsourcing campaigns, where employees can submit and discuss ideas (Beretta, 2019; Hwang et al., 2015; Kruff et al., 2019; Piezunka & Dahlander, 2018). The main focus lies on participants' interaction (Bullinger et al., 2010; Kathan et al., 2015) and the effects on their idea's success (Bockstedt et al., 2016; Sukhov, 2018; Velamuri et al., 2017; Zhu et al., 2019).

Online ideation platforms' central characteristic is that they are digital: Communication can take place regardless of time and place, mainly using multimedia-enriched, text-based content. Thus, they offer easier access to more extensive networks (Katz & Shapiro, 1985; Rode, 2016) with a broader reach and easy availability of databases and other complementary technological tools (Rai & Tang, 2010). Compared with analogue alternatives (e.g., face-to-face interaction), online ideation platforms often make problems visible to a larger group of employees (Björk & Magnusson, 2009) and create more competition to find solutions. Likewise, the probability of receiving feedback increases (Nylén & Holmström, 2015; Zhu et al., 2019) as transaction costs and the efforts of network participants decrease.

These diverse opportunities are often not equally familiar to all participants, who will consequently use the platform differently.

These differences affect the participants' prospects of success due to their differing exposure to and experience with the platform, which can be explained using channel expansion theory. The theory's central argument is that a medium becomes richer for its users as they gain more experience with it, which means that the medium more effectively transmits and exchanges these users' information (Carlson & Zmud, 1994). Recent research applied channel expansion theory to cloud-based virtual learning environments and online health communities (Hew & Kadir, 2016; Mirzaei & Esmaeilzadeh, 2020), legitimizing its application to online ideation platforms.

In line with channel expansion theory, the better participants know the platform and accept it as a supporting medium, the less effort they must invest into platform activities, and the better will be their expected outcome from using the platform. According to Vroom (1964), both factors lead to increased motivation to engage in platform-related activities. This relationship will be examined in detail throughout the hypotheses.

A substantial body of research already explored participants' and potential participants' motivation in online ideation contests (see Table 2). However, most papers do not examine intrinsic motivation in a nuanced manner but only at high level (Buech et al., 2010; Leung et al., 2014; Mack & Landau, 2015; Zimmerling et al., 2019), or they only consider a subset of intrinsic motivation dimensions (Benbya & Leidner, 2018; Bergendahl et al., 2015; Kosonen et al., 2014; Muhdi & Boutellier, 2011; Rode, 2016; Smith et al., 2017; Wendelken et al., 2014). Quantitative studies investigate motivation preferably on the ideation platform but not among employees who contemplate joining the platform (Kosonen et al., 2014; Mack & Landau, 2015; Rode, 2016; Zimmerling et al., 2019). Interestingly, only qualitative studies investigated participants' motivation both before deciding to join the platform and during participation (Benbya & Leidner, 2018; Leung et al., 2014; Muhdi & Boutellier, 2011; Wendelken et al., 2014). In addition, most articles do not consider an actual outcome variable, such as idea quality, selection or implementation, which leaves the de facto benefit to the company unclear (Benbya & Leidner, 2018; Bergendahl et al., 2015; Kosonen et al., 2014; Muhdi & Boutellier, 2011; Rode, 2016; Wendelken et al., 2014). Finally, several studies found nonsignificant relationships between intrinsic motivation and the considered influence factors (Benbya & Leidner, 2018; Mack & Landau, 2015; Rode, 2016; Zimmerling et al., 2019).

Therefore, our study is needed to map the entire individual ideation process toward and on an online ideation platform and relate the specific steps to nuanced aspects of intrinsic motivation.

### 3 | HYPOTHESIS DEVELOPMENT

Our framework's underlying rationale is that increased exposure to online ideation platforms stimulates four motivational factors, each of which addresses a potential participant's different motives, which in turn increase innovative behaviour and eventually idea quality (see Figure 1).

Although the hypotheses differ significantly in content, each hypothesis has a very similar mechanism: According to channel expansion theory, the better employees know a platform's capabilities, the easier and the more effectively they can use it (Carlson & Zmud, 1994; Carlson & Zmud, 1999). In line with expectancy theory, knowledge about the platform's capabilities increases the individuals' evaluation of expectancy, as it becomes potentially easier for them to be innovative (Fairbank et al., 2003). The exposure to the platform and the experience in using it increase the individuals' evaluation of instrumentality since they realize it is easier for them to achieve the desired outcome with the platform (Vroom, 1964). In turn, since each employee pursues individual motives (see Table 1) with a certain value of valence, the employees may also feel a greater desire to pursue a particular outcome more strongly if they realize which functions the online ideation platform offers for achieving this outcome related to their own motives (Van Eerde & Thierry, 1996). Subsequently, the higher the motivation (expectancy • instrumentality • valence) to carry out innovative behaviour on the online ideation platform, the more participants will come up with ideas, iterate on them and promote their own and others' ideas leading to a higher idea quality (Kruft et al., 2018; Scott & Bruce, 1994). This reasoning goes in line with other theories in which behaviour arises from motives, which in turn can be exogenously stimulated (Ajzen, 1991; Bandura & Locke, 2003; Krueger, 1993; Steel & König, 2006).

This overarching mechanism applies both to employees who are already active on the platform and are thus becoming better acquainted with it and to employees who are not yet active on the online ideation platform and are only just grasping its capabilities. They, too, can become significantly more motivated to innovate by realizing how strongly the platform can empower them in realizing their personal motives (Carlson & Zmud, 1999; Fairbank et al., 2003; Vroom, 1964).

Starting with the first hypothesis related to exploration, online ideation platforms offer various qualities to facilitate and stimulate exploration. On the one hand, they generally provide access to large networks (Katz & Shapiro, 1985) with a greater reach than otherwise possible in the workplace, enabling a great deal of exchange and many new social contacts (Rode, 2016). On the other hand, their easy connectivity to other technologies (Rai & Tang, 2010) enables the integration of databases and gives employees access to trend scouts, intelligent search algorithms or other complementary utilities that can impart new knowledge and stimulate learning processes (Chapman & Hyland, 2004; Honig, 2001). Due to lower complexity of use and fewer impediments, both processes increase the attractiveness of explorative activities and increase an outcome's valence (Vroom, 1964).

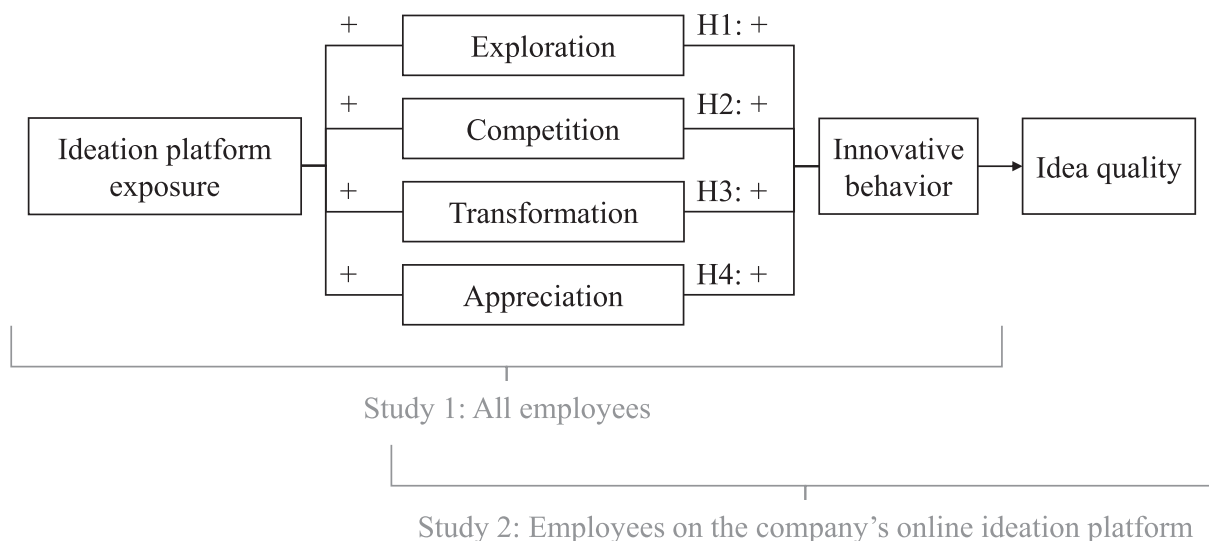
Since only those who use online ideation platforms access these new exploration possibilities, the instrumentality between innovation behaviour and exploration increases. Access to these supporting mechanisms makes it easier for employees to consciously use their potential and to innovate. This support can increase employees' self-efficacy, which is strongly related to expectancy (Bandura, 1997; Van Eerde & Thierry, 1996). By increasing the motivational force

**TABLE 2** Empirical studies on intrinsic motivational mechanisms in the context of corporate online ideation platforms

Study	Context	Empirical setup	Level of analysis	Ideation platform outcome investigated	Aspects of intrinsic motivational factors investigated					High level only <sup>a</sup>
					Exploration	Competition	Transformation	Appreciation		
Zimmerling et al. (2019)	Influence of gamification elements	Quantitative	Employees during an ideation contest	Quantity (comments and posts)						x
Benbya and Leidner (2018)	Case study of an idea management platform	Qualitative	Employees and decision-makers before and during platform activities	Quantity (employee participation and idea submission)	(x)					
Smith et al. (2017)	Case study of corporate ideation contests	Qualitative	One company's ideation contest	Quantity (submissions) and quality (finalists and winners)		x			x	
Rode (2016)	Knowledge-sharing on corporate social media platforms	Quantitative	Employees on corporate social media platforms	Quantity (extent of employees' knowledge sharing)		x			x	
Bergendahl et al. (2015)	Differences in motivation among high and low performers	Quantitative	High and low performers among firm-internal ideation participants	Intention (motivation to generate ideas)	(x)		x			
Mack and Landau (2015)	Self-selection in crowd ideation contests	Quantitative	Employees during an ideation contest	Quality (idea selection)						x
Kosonen et al. (2014)	Relation between trust, motivation, and knowledge sharing	Quantitative	Employees during an ideation contest	-			x			
Wendelken et al. (2014)	Reasons for participation and nonparticipation	Qualitative	Employees before and during platform activities	-		x		x		
Leung et al. (2014)	Case study of a corporate ideation contest	Qualitative	Employees before and during platform activities	Benefits to the company						(x)
Muhdi and Boutellier (2011)	Motivational factors affecting participation and contribution	Qualitative	External community members and employees	-			x		x	
Buech et al. (2010)	Submission intentions on idea suggestions systems	Quantitative	Employees before platform activities	-						(x)

Note: x this aspect was fully investigated; (x) this aspect was investigated only indirectly or just on the sidelines.

<sup>a</sup>Only investigated in an aggregated form, such as "intrinsic motivation".



**FIGURE 1** Conceptual model

exploration, employees' increased intrinsic motivation leads to applying existing knowledge and searching for alternative methods to solve problems to encourage employees to be more innovative (Reiss, 2004; Tu & Lu, 2013). De Jong and Den Hartog (2010) also regard opportunity exploration as an antecedence to idea generation, while Rogers (1954) and Eisenberger (2003) found that openness to new experience fosters a creative orientation, all of which can increase idea quality: The knowledge gathered through exploration provides valuable input for improving their ideas and ultimately developing better ideas (Hwang et al., 2015; Smith et al., 2017). Further, employees who are more motivated by exploration excel more in idea generation, promotion and implementation (Scott & Bruce, 1994).

The more employees know about an online ideation platform, the more they can leverage its opportunities and be innovative. The motivational force exploration mediates this effect since their motivation to carry out innovative behaviour increases as they feel the online ideation platform can satisfy their desire for new knowledge and social exchange (Carlson & Zmud, 1994; Vroom, 1964). The first hypothesis is therefore as follows:

**H1.** Exploration mediates the positive relationship between perceived ideation platform exposure and innovative behaviour leading to the submission of high-quality ideas.

In recent years, a growing research field has dealt with digital content's gamification and, as a key part of this, how to consciously challenge participants to stimulate their ingenuity (Nicholson, 2015). Relevant aspects are a meaningful context combined with scope for action and time restriction, all of which apply to online ideation platforms and increase a challenge's valence for those motivated by competitive factors (Reiss, 2004). Some ideation platforms serve to share stories of failure, while others show innovators struggle during idea campaigns, through which ideation platforms also increase a

challenge's instrumentality. Online ideation platforms' ability to provide visibility and comparability of activities in a network and its high reach can increase the competition among employees, and therefore its motivational force (Boudreau et al., 2011; Reiss, 2004; Vroom, 1964). In addition to the challenge of innovation behaviour, topic-specific ideation campaigns also stimulate this motivational force and eventually result in innovative behaviour (Hong et al., 2016; Janssen, 2001; Tu & Lu, 2013).

Such competition-motivated innovative work behaviour most likely differs from that motivated by exploration. Employees who innovate because of competitiveness probably focus on promoting their ideas and better positioning them compared with other ideas, instead of just exploring exciting ideas and exchanging them with others (Scott & Bruce, 1994). However, competing participants try to develop the best ideas to excel at their tasks and in front of others. Conversely, if participants did not worry about winning, they would not invest further energy into improving ideas. Thus, this motivational mechanism ultimately leads to a continuous improvement of ideas and the generation of higher-quality ideas.

**H2.** Competition mediates the positive relationship between perceived ideation platform exposure and innovative behaviour leading to the submission of high-quality ideas.

Due to their network structure, online ideation platforms also offer opportunities to fulfil the feeling of achieving a purpose by contributing to other ideas, helping to solve issues and contributing with own ideas. Online ideation platforms make problems accessible to a large number of employees (Björk & Magnusson, 2009)—if they have enough experience to access this information (Carlson & Zmud, 1999)—which increases the desirability to transform and impact these individuals' environment (Van Eerde & Thierry, 1996). Digital platforms often suggest a straightforward way for how to



contribute. On ideation platforms, for instance, it is the submission of ideas, comments or likes (Zhu et al., 2019). Therefore, online ideation platforms also provide clear instrumentality on fulfilling the desire to contribute: through innovative behaviour. The visibility of ideas needing improvement also encourages the desire to help and cooperate and, subsequently, take more risks, which is a fertile basis for innovative behaviour (Baer & Frese, 2003).

Again, the innovative behaviour stimulated by transformational motivation may differ in detail from the behaviour evoked by exploration and competition: Individuals who seek to help others and generate impact are more likely to cooperate with others, promote not only their but also others' ideas and place a stronger focus on the ideas' feasibility (Reiss, 2004; Scott & Bruce, 1994; Van Eerde & Thierry, 1996), as the goal of developing practical ideas that make a difference is much more important to transformation-motivated participants than being the owner of the best idea. This collaborative and outcome-oriented approach has great potential to generate better ideas than any participant would be able to do on their own (Gamber et al., 2021; Pinto & Pinto, 1990). Hence,

**H3.** Transformation mediates the positive relationship between perceived ideation platform exposure and innovative behaviour leading to the submission of high-quality ideas.

Once employees get used to an online ideation platform, other employees' activities are more transparent. Using artefacts such as badges, ranks or titles can reward employees for innovative behaviour, making such artefacts socially desirable, which increases the valence of appreciation (Nicholson, 2015; Sedera et al., 2016; Vroom, 1964). Clearly linking artifacts and other rewards to innovative achievements increases the instrumentality of appreciation (Füller et al., 2007). Further, platforms' ease of use usually leads to swift and frequent feedback (Nylén & Holmström, 2015; Zhu et al., 2019) since the transaction costs and the effort for the network participants are lower. Quick feedback can increase expectancy since employees do not feel alone with their daily problems concerning innovation activities. Overall, these mechanisms lead to a stronger motivational force concerning appreciation.

According to Janssen (2000), innovation behaviour occurs when the ratio between effort spent and reward received is advantageous for an individual. If employees receive more rewards that are simultaneously more visible due to digital platforms characteristics, they perceive their own activities as more valuable, rewarding and motivating and are more likely to be innovative (Eisenberger, 2003; Eisenberger & Selbst, 1994; Fuller et al., 2006). The innovative behaviour resulting from employees motivated by appreciation depends entirely on the reward mechanisms of the online ideation platform. However, since such badges and ranks are usually intentionally designed to reward good contributions and ideas, the platform design automatically creates a mechanism that increases the participants' idea quality (Boudreau et al., 2011). Accordingly, the fourth hypothesis is as follows:

**H4.** Appreciation mediates the positive relationship between perceived ideation platform exposure and innovative behaviour leading to the submission of high-quality ideas.

## 4 | METHOD

### 4.1 | Study design and case company

The empirical context is a leading international science and technology company, which implemented various activities and platforms to encourage employees' innovative behaviour. In particular, a firm-wide promotion of an online ideation platform enabling idea generation and implementation encouraged idea submission in campaigns. Via this platform, employees also have access to knowledge and trend databases for inspiration and idea validation. Additionally, employees can attend online workshops that encourage and enable them to take initiative.

We conducted two separate studies within the company to uncover a comprehensive understanding of the mechanisms between online ideation platforms and employees (see Figure 1). Study 1 focuses on how employees perceive the ideation platform's capabilities and how knowing about them motivates them to behave innovatively. Study 2 focuses on one main idea contest hosted on the online ideation platform. Before the contest, we asked participants about their motivations toward the idea contest in a short survey and linked this information to the platform data. Therefore, study 2 validates the first study's relationships but complements it by adding a specific innovation outcome, namely idea quality. Compared with previous research on ideation platforms, this two-study design has the advantage that we can include nonparticipants (study 1) but simultaneously consider quality outcomes on the platform (study 2).

*Study 1:* We addressed all 8000 employees at the company's main site in Germany, and 1630 of them fully answered the survey (18.4% response rate). Table 3 gives a sample overview. Concerning nonresponse bias, *t*-tests show no significant differences between early and late respondents in the variables. The model uses a multilevel fixed-effects approach to control for department-specific influences because individuals are nested in  $N = 136$  workgroups (between 1 and 57 per group).

*Study 2:* We conducted a second study to further validate the partially overlapping results to study 1 (see Figure 1) and to examine in detail one of the online ideation platforms' research-intensive ideation contests and its outcome variable idea quality. Before the closing of the contest, we surveyed the participants about the key constructs in the model. A total of 279 of the 1056 participants completed the survey, who submitted 678 ideas, representing most of the 892 ideas submitted. One hundred thirty-one experts evaluated the ideas, and each expert assessed an average of 31 ideas resulting in 4114 evaluations. The company provided the experts and selected them based on the required expertise regarding each ideas' topics. They rated dimensions like competitive advantage, innovation potential, market

**TABLE 3** An overview of studies 1 and 2

	Study 1	Study 2
Gender		
Male	55.6%	67.7%
Female	44.4%	32.3%
Age		
<30	18.2%	15.8%
30 to 40	33.6%	42.6%
40 to 55	41.3%	39.8%
>55	6.9%	1.8%
Tenure		
<1 year	5.4%	15.8%
1 to 5 years	15.8%	38.4%
5 to 10 years	22.0%	20.0%
10 to 20 years	30.9%	19.4%
20 to 40 years	25.1%	5.0%
>40 years	0.8%	1.4%
Education		
No Ph.D.	80.8%	62.4%
Ph.D. or higher	19.2%	37.6%

Note:  $n_1 = 1630$  individuals for study 1;  $n_2 = 279$  individuals for study 2.

attractiveness and value proposition, but relevant for the selection process was the overall rating they gave independently of these rated subdimensions. Like in study 1, *t*-tests indicated no significant differences between early and late respondents regarding the central constructs of the study. Table 3 shows the sample's overview.

## 4.2 | Measures

Due to the considerable overlap in studies 1 and 2, we describe the measures collectively but explicitly mention when a measure is study-specific. All variables are shown in Table 4, referencing the study in which they appear.

The measure for innovative behaviour stems from Janssen's (2001) nine-item scale, which builds a single-order construct (study 1:  $\alpha = .80$ ; study 2:  $\alpha = .85$ ) and considers the extent to which employees try to generate, promote, and implement ideas (Table 4). For this variable, the surveys pose slightly different contexts between the two studies. Thus, innovative behaviour in study 1 deliberately refers to the employees' overarching innovative work behaviour within the entire company, explicitly including the company's online ideation platform. In study two, innovative work behaviour refers explicitly to the activities carried out on the online ideation platform. The variable idea quality is the mean rating of an ideator's submitted ideas. Each ideas' rating again results from the overall rating the evaluators gave the idea. In this way, this variable joins the operationalization of other studies that conceptualize idea quality in the same manner (Boudreau et al., 2016; Chen et al., 2009).

For the independent variable perceived ideation platform exposure (study 1:  $\alpha = .86$ ), we adapted Kruff et al.'s (2018) six-item measure of an innovation ecosystem's perceived influence (in their case, a corporate incubator). The variable indicates employees' awareness and perceived support of the firm's online ideation platform. It indicates the employees' exposure to the platform, which fits channel expansion theory (Carlson & Zmud, 1994).

We use a well-established method to measure the components of expectancy theory (Van Eerde & Thierry, 1996) by directly measuring performance valence instead of computing it from a potentially measured outcome valence and instrumentality. Since Vroom did not intend single direct effects of valence, instrumentality or expectation, the performance valence is then directly multiplied by the expectancy, resulting in the various motivational forces (Vroom, 1964). To find proper outcome-related valences according to the four derived motives, we construct 15 suitable innovative behaviour outcomes, inspired by Reiss's comprehensive general 16 motives (Reiss & Havercamp, 1998), aligned to innovation-related organizational behaviour. We present the factor analysis for study 1 to avoid redundancy; study 2's results are highly comparable. The survey asked, "What are the reasons for you to become innovative (e.g., generate, develop and promote ideas) in the near future?" for possible answers (1–12 in Table 5). The participants rated these outcomes in accordance with their own expected outcomes on a 5-point Likert scale, resulting in these outcomes' performance valences (Table 5).

As this method increases the risk of omitted yet relevant outcomes (Van Eerde & Thierry, 1996), the survey setup allowed the participants to name and evaluate further outcomes in an open text field with the same rating scale. Participants added only a few, and mostly lowly rated, outcomes. The list of motives for online ideation platforms should therefore be comprehensive. The expectancy comprises three items related to performance (i.e., innovative behaviour) and appears in Table 5 (numbers 13–15).

The assessment of convergent validity, discriminant validity and unidimensionality through factor analysis reveals good loading patterns (Table 5). The results support convergent and discriminant validity (Fornell & Larcker, 1981) for all variables, except for exploration, which has an average variance extracted (AVE) of .445—slightly lower than the highest squared correlation (SC). A subsequent assessment of the measures by confirmatory factor analysis yields an acceptable fit ( $\chi^2 = 894$  (df = 188);  $p < .00$ ), Standardized Root Mean Square Residual (RMSEA) = .053, Comparative Fit Index (CFI) = .931, Standardized Root Mean Square Residual (SRMR) = .043). Finally, applying Cronbach's alpha reliability scores (Table 4) leads to a good fit. Excluding the items with lower factor loadings led to very similar results.

Incorporating various control variables that may affect individuals' innovative behaviour and motivational forces further improves the models' robustness. Besides typical control variables such as gender, age, education and tenure (Table 3), the employees' personal characteristics supplement the control variables by incorporating the constructs creativity, conformity and attention to detail into the models, as they have shown to be relevant to innovative behaviour (Miron et al., 2004). Since innovation climate can have a decisive effect on

TABLE 4 Construct measures and sources

Constructs	Items and description
Innovative behaviour (Janssen, 2001) $\alpha = .80$ (study 1) $\alpha = .85$ (study 2)	Idea generation <ul style="list-style-type: none"> <li>• I often come up with new ideas for improvements.</li> <li>• I often seek new working methods, techniques, or tools.</li> <li>• I often generate original solutions to problems.</li> </ul> Idea promotion <ul style="list-style-type: none"> <li>• I often speak up for innovative ideas.</li> <li>• I often get approval for innovative ideas.</li> <li>• I often stimulate enthusiasm about innovative ideas among important members of the organization.</li> </ul> Idea realization <ul style="list-style-type: none"> <li>• I often transform innovative ideas into useful applications.</li> <li>• I often introduce innovative ideas into the work environment in a systematic way.</li> <li>• I often evaluate the utility of innovative ideas.</li> </ul>
Idea quality (Boudreau et al., 2016; Chen et al., 2009); Study 2 only	Ideators' ideas' mean rating (1 to 5 stars) by evaluators
Perceived ideation platform exposure (Kruff et al., 2018) $\alpha = .86$ (study 1)	Awareness of the online ideation platform <ul style="list-style-type: none"> <li>• I have already heard a lot about the [online ideation platform name].</li> <li>• I very often visit the [online ideation platform name].</li> <li>• I am very familiar with the activities on the [online ideation platform name].</li> </ul> Support by the online ideation platform <ul style="list-style-type: none"> <li>• The [online ideation platform name] inspires me to think through new ideas.</li> <li>• The [online ideation platform name] actively supports my creativity.</li> <li>• The [online ideation platform name] actively supports me in implementing my ideas.</li> </ul>
Expectancy for innovative behaviour (study 1; see Table 5)	<ul style="list-style-type: none"> <li>• If I make an effort, I can generate superior ideas</li> <li>• If I make an effort, I can promote ideas very well</li> <li>• If I make an effort, I can implement ideas very well</li> </ul>
Performance valences (motives) for innovative behaviour on online ideation platforms. (study 1; see Table 5 for the factor analysis results)	What are the reasons for you to become innovative (e.g., generate, develop, and promote ideas) in the near future? [exploration; $\alpha = .69^a$ ] <ul style="list-style-type: none"> <li>• Have fun (<math>\lambda = 0.63</math>)</li> <li>• Meet new people (<math>\lambda = 0.65</math>)</li> <li>• Gain more knowledge (<math>\lambda = 0.71</math>)</li> </ul> [competition; $\alpha = .72^a$ ] <ul style="list-style-type: none"> <li>• Take responsibility (<math>\lambda = 0.67</math>)</li> <li>• Face challenges (<math>\lambda = 0.68</math>)</li> <li>• Show what I can achieve (<math>\lambda = 0.69</math>)</li> </ul> [transformation; $\alpha = .70^a$ ] <ul style="list-style-type: none"> <li>• Make a difference (<math>\lambda = 0.78</math>)</li> <li>• Contribute to a better world (<math>\lambda = 0.63</math>)</li> <li>• Contribute to [company name] as a company (<math>\lambda = 0.58</math>)</li> </ul> [appreciation; $\alpha = .78^a$ ] <ul style="list-style-type: none"> <li>• Make a name for myself (<math>\lambda = 0.85</math>)</li> <li>• Gain appreciation (<math>\lambda = 0.84</math>)</li> <li>• Generate income (<math>\lambda = 0.52</math>)</li> </ul>
Innovation climate (Kruff et al., 2018; Patterson et al., 2005) $\alpha = .88$ (study 1) $\alpha = .87$ (study 2)	Openness and flexibility <ul style="list-style-type: none"> <li>• New ideas are readily accepted here. (<math>\lambda = 0.72</math>)</li> <li>• Assistance in developing new ideas is readily available. (<math>\lambda = 0.77</math>)</li> <li>• People here are always looking for new ways to approach problems. (<math>\lambda = 0.81</math>)</li> <li>• People here are quick to respond when changes need to be made. (<math>\lambda = 0.73</math>)</li> <li>• People here are very flexible; we can quickly change procedures to respond to new conditions and solve problems as they arise. (<math>\lambda = 0.72</math>)</li> </ul> Reflexivity <ul style="list-style-type: none"> <li>• Objectives are modified in light of changing circumstances. (<math>\lambda = 0.59</math>)</li> <li>• The way people work together is readily changed in order to improve performance. (<math>\lambda = 0.73</math>)</li> <li>• There are regular discussions as to whether people are working effectively together. (<math>\lambda = 0.71</math>)</li> </ul>

(Continues)

TABLE 4 (Continued)

Constructs	Items and description
	Supervisory support <ul style="list-style-type: none"> <li>Supervisors here are friendly and easy to approach. (<math>\lambda = 0.82</math>)</li> <li>Supervisors show that they have confidence in those they manage. (<math>\lambda = 0.92</math>)</li> <li>Supervisors can be relied upon to give good guidance to people. (<math>\lambda = 0.70</math>)</li> </ul> Participation <ul style="list-style-type: none"> <li>Management involves people when decisions are made that affect them. (<math>\lambda = 0.78</math>)</li> <li>People feel decisions are frequently made over their heads. (<math>\lambda = 0.83</math>)<sup>b</sup></li> <li>People do not have any say in decisions that affect their work. (<math>\lambda = 0.77</math>)<sup>b</sup></li> </ul> Psychological safety <ul style="list-style-type: none"> <li>Employees are able to address problems and tough issues. (<math>\lambda = 0.73</math>)</li> <li>It is difficult to ask others for help in our company. (<math>\lambda = 0.48</math>)<sup>b</sup></li> <li>When someone makes a mistake, it is often held against them. (<math>\lambda = 0.72</math>)</li> <li>Failure is seen as a means of improvement and a necessary part of success. (<math>\lambda = 0.65</math>)</li> </ul> Communication <ul style="list-style-type: none"> <li>Access to information is quick and easy. (<math>\lambda = 0.49</math>)</li> <li>Employees here engage in open and honest communication. (<math>\lambda = 0.82</math>)</li> <li>There is no hiding of any issues from each other. (<math>\lambda = 0.83</math>)</li> </ul> Collaboration <ul style="list-style-type: none"> <li>There is very little conflict between departments here. (<math>\lambda = 0.77</math>)</li> <li>Collaboration between departments is very effective. (<math>\lambda = 0.87</math>)</li> <li>There is very little respect between some of the departments here. (<math>\lambda = 0.56</math>)<sup>b</sup></li> </ul>
Creativity (Miron et al., 2004) $\alpha = .72$ (study 1) $\alpha = .69$ (study 2)	<ul style="list-style-type: none"> <li>I enjoy finding solutions to complex problems.</li> <li>I prefer tasks that enable me to think creatively.</li> <li>I like to do things in an original way.</li> </ul>
Conformity (Miron et al., 2004) $\alpha = .62$ (study 1) $\alpha = .70$ (study 2)	<ul style="list-style-type: none"> <li>I adapt myself to the system.</li> <li>I adhere to accepted rules in my area of work.</li> <li>I avoid cutting corners.</li> </ul>
Attention to detail (Miron et al., 2004) $\alpha = .79$ (study 1) $\alpha = .69$ (study 2)	<ul style="list-style-type: none"> <li>I am thorough when solving problems.</li> <li>I pay attention to the small details needed to perform a task.</li> <li>I perform a task precisely over a long period of time</li> </ul>

Note: Construct names were not shown in the survey, and item order was randomized;  $\lambda$  confirmatory factor analysis factor loadings.

<sup>a</sup>Construct names according to exploratory factor analysis results from Table 5.

<sup>b</sup>Inverse item.

the employees' motivation and participation decision, we also control comprehensively for the innovation climate perceived by each individual with a seven-construct second-order operationalization with 24 items (study 1:  $\alpha = .88$ ; study 2:  $\alpha = .87$ ), based on Krufft et al. (2018) and in accordance with Patterson et al. (2005) comprising openness and flexibility, reflexivity, supervisory support, participation, communication, collaboration and psychological safety (Table 3). Confirmatory factor analysis confirms this conceptualization, although five items' factor loadings were below .7; robustness checks showed the same results without these items. The application of fixed-effects regression inherently controls for all influencing factors at the departmental level. The descriptive statistics appear in Tables 6 and 7.

## 5 | RESULTS

For study one, a multilevel general least squares regression analysis serves as a basis for testing the hypotheses. Table 8 summarizes the regression results of the motivational forces and the regression results of innovative behaviour.

Table 8 shows the regression results, including the independent variable (Model 9) and the mediators (Model 10). Models 11 and 12 show the same regression models but without the independent variable. Because the Hausman tests were significant for most models, all models consistently apply department-level fixed effects. The highest variance inflation factor (VIF) is 4.41, with a mean VIF of 2.13. Collinearity should, therefore, not excessively affect the regression estimates. As a robustness check, we calculated the models also without control variables, and the results remained very similar.

The procedure by Zhao et al. (2010) investigates the mediation hypotheses by testing the significance of the independent variable's indirect effect for each mediator, using a bootstrap procedure with 1000 repetitions. Table 8 (last column) provides the results. Perceived ideation platform exposure's indirect effect on innovative behaviour mediated by exploration is insignificant ( $-.006, p = .527$ ), providing no support for H1. The indirect effects via competition (.036,  $p = .000$ ), transformation (.05,  $p = .000$ ) and appreciation (.008,  $p = .038$ ) are positive, providing first support for H2, H3 and H4. Platform influence's indirect effects amount to 34.2% of platform influence's overall effect on innovative behaviour.

**TABLE 5** Results of valences' (V) and expectancy's exploratory factor analysis

	Variable	V_explor	V_comp	V_transf	V_appr	Expectancy
1	Have fun	<b>.752</b>	.116	−.026	−.099	.058
2	Meet new people	<b>.817</b>	−.009	.008	.117	−.082
3	Gain more knowledge	<b>.638</b>	.095	.154	−.020	.028
4	Take responsibility	.048	<b>.673</b>	−.015	.135	.040
5	Face challenges	.105	<b>.794</b>	.047	−.097	.023
6	Show what I can achieve	.008	<b>.638</b>	−.078	.389	−.052
7	Make a difference	.013	.260	<b>.689</b>	−.111	.035
8	Contribute to a better world	.135	−.193	<b>.865</b>	.048	−.005
9	Contribute to [company name] as a company	−.172	.318	<b>.611</b>	.068	−.028
10	Make a name for myself	.010	.144	−.078	<b>.808</b>	.058
11	Gain appreciation	−.010	.171	−.012	<b>.787</b>	−.001
12	Generate income	.012	−.250	.130	<b>.822</b>	−.017
13	If I make an effort, I can generate superior ideas	.047	−.053	.058	.083	<b>.758</b>
14	If I make an effort, I can promote ideas very well	−.011	.007	−.026	.023	<b>.879</b>
15	If I make an effort, I can implement ideas very well	−.044	.041	−.010	−.046	<b>.876</b>
	Variance explained (96.83%; rotated factors)	19.75%	19.39%	19.32%	18.62%	19.75%

Note:  $n = 1630$  individuals, bold values indicate factor loadings higher than .60.

**TABLE 6** Descriptive statistics of study 1

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1 Innovative behaviour	3.24	.81											
2 Female	.44	.50	−.15										
3 PhD	.19	.39	.21	−.12									
4 Creativity	4.04	.72	.55	−.09	.17								
5 Conformity	3.57	.71	−.03	.07	−.13	−.01							
6 Detail	4.19	.62	.10	.06	−.05	.22	.35						
7 Innovation climate	3.37	.65	.18	−.02	.00	.10	.21	.22					
8 Perceived ideation platform exposure	2.96	.83	.40	−.02	.14	.21	.00	−.01	.28				
9 Exploration	14.37	4.63	.53	−.06	.13	.43	.07	.10	.18	.37			
10 Competition	13.77	4.79	.56	−.10	.11	.43	.08	.14	.16	.31	.82		
11 Transformation	14.67	4.69	.57	−.07	.12	.43	.09	.17	.20	.37	.84	.83	
12 Appreciation	10.22	4.53	.42	−.12	.07	.28	.11	.07	.10	.22	.62	.72	.62

Note:  $n = 1630$ , individuals; all correlations above .05 were significant at 5%; the dummy variables for tenure and age were excluded from the table for reasons of clarity.

Study 2 also uses ordinary least squares regression analysis. Table 9 summarizes the regression results of both innovative behaviour and idea quality showing the regression results with control variables only (Models 1 and 3), the independent variables (Model 2) and the mediator (Model 4). The highest VIF is 2.76, with a mean VIF of 1.65. Collinearity should, therefore, not excessively affect the regression estimates. Table 9 (last column) also provides the bootstrapped mediation analysis results for study 2. The indirect effect of exploration on idea submission mediated by innovative behaviour is insignificant ( $−.063$   $p = .72$ ), which mirrors the finding from study 1 on the lack of a significant mediation effect for exploration, giving no support for hypothesis 1. The indirect effects of competition ( $.097$ ,  $p = .014$ ),

transformation ( $.224$ ,  $p = .018$ ) and appreciation ( $.033$ ,  $p = .004$ ) via innovative behaviour are positive, providing support for H2, H3 and H4—consistent with study 1.

## 6 | DISCUSSION

The results provide evidence that exposure to and subsequent experience with online ideation platforms and their opportunities strengthens innovative behaviour and increases the submission of high-quality ideas via different motivational forces (Reiss, 2004; Vroom, 1964). In other words, the mere existence of online ideation

**TABLE 7** Descriptive statistics of study 2

Variable	Mean	s.d.	1	2	3	4	5	6	7	8	9	10	11
1 Idea quality	2.93	.72											
2 Female	.33	.47	-.06										
3 PhD	.38	.49	.19	-.08									
4 Creativity	5.61	1.26	-.06	-.06	.06								
5 Conformity	5.41	1.18	-.09	.12	-.08	-.01							
6 Detail	5.65	.90	-.05	.05	.03	.14	.23						
7 Innovation climate	5.07	1.09	.04	-.04	-.04	-.03	.18	-.01					
8 Innovative behaviour	5.93	.73	.01	-.13	.10	.38	-.03	.13	-.04				
9 Exploration	15.87	3.53	-.03	.07	.02	.16	.05	.14	.10	.09			
10 Competition	16.96	3.54	-.02	.00	.05	.12	.17	.23	.06	.23	.35		
11 Transformation	18.10	3.36	-.05	-.01	-.17	.11	.15	.07	.00	.31	.24	.30	
12 Appreciation	12.27	5.57	-.07	-.12	.04	.14	.17	.21	.06	.17	.25	.37	.19

Note:  $n = 279$ , individuals; all correlations above .12 were significant at 5%; the dummy variables for tenure and age were excluded from the table for reasons of clarity.

platforms motivates employees to become innovative—as long as they know about their existence (Carlson & Zmud, 1994): According to our operationalization of online ideation platform exposure (see Table 4), even the awareness of such a platform's existence increases the likelihood that employees will become more innovative and submit high-quality ideas.

The reason for this mechanism is that, according to channel expansion theory (Carlson & Zmud, 1994; Carlson & Zmud, 1999), increased knowledge of the online ideation platform's capabilities and possibilities and, over time, a better proficiency with the platform make it easier for employees to innovate on it, which, according to expectancy theory (Van Eerde & Thierry, 1996; Vroom, 1964), increases the valence, instrumentality and expectancy and thus the resulting motivational force to become and remain active on the platform (Fairbank et al., 2003).

However, this motivational chain can only be effective if the same individually different motivational factors that encourage employees can also be fostered and stimulated by the platform (Reiss, 2004; Vroom, 1964). In this paper, we conceptually identified four intrinsic motivational factors that digital platforms should promote particularly well. The empirical two-study analysis shows that digital platforms promote three of these motivational factors from the first contact with an employee to a high-quality idea—whether through the platforms' inherent properties of making a more extensive network available (Katz & Shapiro, 1985), providing more possibilities for appreciation from like-minded people (Eisenberger, 2003; Eisenberger & Selbst, 1994; Fuller et al., 2006), stronger exposure to competition from others (Boudreau et al., 2011) or through the ability to support others and achieve transformation regardless of time and place. The results also show that the motivational process for the motivational force exploration breaks down along the chain: The exposure of and subsequent experience with digital platforms promotes the motivation to engage in exploratory activities, but this does not necessarily result in innovative behaviour and high-quality ideas.

Presumably, two effects cancel each other out: While knowledge may be the ultimate goal of exploration, thinking, exploring and problem-solving are not necessarily pleasant. These activities tend to be frustrating and encourage uncertainty, even leading to the valence of exploration becoming negative. If so, the whole motivational effect of exploration, according to expectancy theory, would reverse (Vroom, 1964). Reiss (2004) argues that curiosity prevails among people with a strong explorative motivational force, which is why they may explore new things even if they are insecure or must endure severe criticism or failure. Thus, the single motive to explore may just not always be enough to push employees to become an innovator and submit high-quality ideas. But in fact, individuals are rarely motivated by a single desire alone but rather by a combination of motivational factors, such as exploration, competition, appreciation, and transformation (Reiss, 2004). According to Vroom, these motivational factors add up as they do in a simple multivariate regression equation (see the formula in chapter 2.1). Should this still not suffice, however, adding up additional extrinsic motivation could help: Although extrinsic motivation alone might foster unethical behaviour (Scheiner et al., 2018) and “offering extrinsic incentives can supplant intrinsic motivation [, but] if the extrinsic rewards are perceived as a form of performance feedback,” intrinsic motivation can survive (Fairbank et al., 2003: 309).

## 6.1 | Implications for theory

The results reveal two major implications for motivation and online ideation platform literature. First, we contribute to both literature streams by providing evidence that digital platforms, through their inherent characteristics, can even motivate employees who do not have much experience with online ideation platforms to submit ideas, innovate on the platform and ultimately submit high-quality ideas. This perspective is only rendered possible by the holistic approach of

**TABLE 8** Regression results of motivational forces and innovative behaviour (study 1)

	Exploration		Competition		Transformation		Appreciation		Innovative behaviour			Bootstrapped indirect mediation effects <sup>a</sup>	
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)
Female	-.452* [.215]	-.451* [.207]	-.770*** [.228]	-.769*** [.223]	-.618** [.220]	-.617** [.212]	-1.146*** [.230]	-1.145*** [.228]	-.159*** [.033]	-.106*** [.031]	-.159*** [.035]	-.103** [.032]	
PhD	.890** [.308]	.604* [.297]	.871** [.325]	.645* [.320]	.769* [.314]	.486 [.304]	.478 [.328]	.32 [.326]	.153** [.048]	.119** [.044]	.200*** [.050]	.143** [.045]	
Age	Yes (4)	Yes (4)	Yes (4)	Yes (4)	Yes (4)	Yes (4)	Yes (4)	Yes (4)	Yes (4)	Yes (4)	Yes (4)	Yes (4)	
Tenure	Yes (6)	Yes (6)	Yes (6)	Yes (6)	Yes (6)	Yes (6)	Yes (6)	Yes (6)	Yes (6)	Yes (6)	Yes (6)	Yes (6)	
Creativity	2.517*** [.150]	2.249*** [.146]	2.553*** [.158]	2.340*** [.157]	2.451*** [.153]	2.185*** [.150]	1.558*** [.160]	1.409*** [.161]	.494*** [.024]	.355*** [.024]	.538*** [.024]	.362*** [.024]	
Conformity	.399* [.157]	.420** [.151]	.469** [.166]	.486** [.162]	.435** [.160]	.456** [.154]	.702*** [.167]	.714*** [.165]	-.001 [.024]	-.035 [.022]	-.004 [.025]	-.041 [.023]	
Detail	-.057 [.184]	.108 [.177]	.319 [.194]	.450* [.191]	.463* [.188]	.626*** [.182]	-.037 [.196]	.055 [.195]	.012 [.029]	-.020 [.027]	-.015 [.030]	-.039 [.027]	
Innovation climate	.686*** [.173]	.177 [.173]	.566** [.183]	.163 [.186]	.885*** [.177]	.381* [.177]	.252 [.184]	-.03 [.190]	.114*** [.028]	.099*** [.026]	.196*** [.028]	.147*** [.025]	
Perceived innovation platform exposure	1.510*** [.137]	1.199*** [.148]			1.494*** [.140]		.838*** [.151]	.246*** [.022]		.163*** [.021]			
Exploration										-.005 [.007]		.001 [.007]	-.006 [.010]
Competition										.029*** [.007]		.027*** [.007]	.036*** [.009]
Transformation										.030*** [.007]		.035*** [.007]	.050*** [.011]
Appreciation										.013** [.005]		.012** [.005]	.008* [.004]
Constant	1.932 [1.050]	-.285 [1.031]	-.147 [1.110]	-1.907 [1.108]	-.996 [1.072]	-3.191** [1.055]	2.296* [1.120]	1.065 [1.131]	.053 [.166]	.189 [.154]	.414* [.169]	.423** [.154]	
R <sup>2</sup> <sub>within</sub>	.234	.291	.234	.266	.232	.286	.14	.157	.380	.477	.330	.457	
R <sup>2</sup> <sub>between</sub>	.382	.434	.35	.383	.285	.39	.245	.249	.490	.639	.401	.616	
R <sup>2</sup> <sub>overall</sub>	.263	.321	.252	.289	.248	.31	.155	.174	.419	.512	.362	.489	
F	33.024	41.341	32.913	36.435	32.677	4.309	17.565	18.783	61.788	72.344	53.042	7.346	
p	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	.000	

Note: Fixed-effects multilevel regression. n = 1630 individuals; N = 136 groups; unstandardized coefficients with standard errors in brackets.  
<sup>a</sup>Mediation analysis based on Zhao, Lynch, and Chen (2010) and Hayes (2013) using a bootstrap procedure with 1,000 repetitions.  
 \*p < .05. \*\*p < .01. \*\*\*p < .001.

**TABLE 9** Regression results of innovative behaviour and idea quality (study 2)

	Innovative behaviour		Idea quality		Bootstr. Indirect mediation effects <sup>a</sup>
	(1)	(2)	(3)	(4)	
Female	−1.708 [.898]	−1.229 [1.085]	−.418 [.923]	−.49 [1.158]	
PhD	1.008 [.867]	1.519 [.858]	3.128*** [.873]	3.134*** [.929]	
Age	Yes (4)	Yes (4)	Yes (4)	Yes (4)	
Tenure	Yes (6)	Yes (6)	Yes (6)	Yes (6)	
Creativity	2.220*** [.352]	2.005*** [.266]	−.385 [.471]	−.445 [.496]	
Conformity	−.167 [.429]	−.557 [.392]	−.485 [.376]	−.436 [.435]	
Detail	1.041 [.553]	.807 [.504]	−.333 [.602]	−.318 [.584]	
Innovation climate	−.152 [.288]	−.079 [.261]	.269 [.280]	.286 [.330]	
Exploration		−.164 [.092]		−.005 [.102]	−.063 [.035]
Competition		.252 [.195]		.026 [.172]	.097* [.040]
Transformation		.584*** [.047]		.011 [.145]	.224* [.095]
Appreciation		.085* [.035]		−.078 [.120]	.033** [.012]
Innovative behaviour				.385* [.156]	
Constant	39.628*** [3.733]	29.805*** [4.888]	34.648*** [1.940]	32.950*** [3.415]	
R <sup>2</sup>	.223	.321	.091	.095	

Note:  $n = 279$  individuals; unstandardized coefficients with standard errors in brackets.

<sup>a</sup>Mediation analysis based on Zhao, Lynch, and Chen (2010) and Hayes (2013) using a bootstrap procedure with 1000 repetitions.

\* $p < .05$ . \*\* $p < .01$ . \*\*\* $p < .001$ .

our two-study concept, where study 1 includes potential participants and nonparticipants and study 2 focuses on the participants on the online ideation platform. By doing so, we are expanding on the different perspectives, particularly of the qualitative research in this field, which has already pioneered the mechanisms of how employees become ideation platform participants (Benbya & Leidner, 2018; Leung et al., 2014; Wendelken et al., 2014). Specifically, these qualitative studies and other quantitative ones on initial engagement with ideation platforms (Buech et al., 2010) do not reveal participation success through intrinsic motivation alone. So our findings contribute insights into how to make an initial motivation to successfully participate on online ideation platforms possible in the first place. Through study 2, in particular, we can show that innovative behaviour on the platform explains why motivational factors affect idea quality: The identified motivational factors motivate to come up with ideas, to iterate, to promote ideas and to think about implementation and also to engage with other ideas, which is what makes achieving high idea quality possible in the first place since motivation only has an indirect effect on idea quality via innovative behaviour and not directly on

idea quality. This perspective is also new in the motivation and online ideation platform literature, as so far, to the best of our knowledge; only Mack and Landau (2015) and Smith et al. (2017) have investigated the relationship between intrinsic motivation and idea quality or similar outcome variables. Still, Smith et al.'s (2017) qualitative research could only make initial assumptions about two of the four intrinsic factors we considered. Mack and Landau (2015) could not find any significant difference between the intrinsic motivation of successful participants and nonparticipants.

Second, we contribute to motivation and online ideation platform literature by deriving and empirically testing four comprehensive motivational factors as mediators that especially online ideation platforms can promote. The majority of motivation articles about online ideation platforms do not examine intrinsic motivation in a nuanced manner but only at a high level, or they only consider a subset of intrinsic motivation dimensions as shown in Table 2 (Benbya & Leidner, 2018; Bergendahl et al., 2015; Buech et al., 2010; Kosonen et al., 2014; Leung et al., 2014; Mack & Landau, 2015; Muhdi & Boutellier, 2011; Rode, 2016; Smith et al., 2017; Wendelken



et al., 2014; Zimmerling et al., 2019). As already discussed, the mediation effect via exploration is insignificant but not via the other three motivational factors. This may be the reason why some studies only obtained insignificant effects of intrinsic motivation (Benbya & Leidner, 2018; Mack & Landau, 2015; Rode, 2016; Zimmerling et al., 2019) as they analysed intrinsic motivation only as a high-level construct or did not consider all potentially relevant intrinsic factors.

## 6.2 | Implications for practice

First, companies should establish online ideation platforms and increase their visibility and awareness. They are a cost-efficient way to innovate (Sedera et al., 2016) and, as our results show, a suitable way to motivate employees to innovate and develop high-quality ideas (Carlson & Zmud, 1994; Carlson & Zmud, 1999; Vroom, 1964).

Second, the motivational forces of competition, transformation and appreciation serve as effective mediators between perceived ideation platform exposure and innovative behaviour as well as idea quality. Therefore, managers should focus on these three motivational factors to stimulate innovative behaviour via online ideation platforms. To this end, these motives' outcomes must be achievable via innovative behaviour—thus, employees should be able to fulfil their desires of appreciation, competition and transformation while being innovative on the ideation platform. Further, a clear process on how employees can achieve these outcomes via innovative behaviour must be developed and communicated (Vroom, 1964). For instance, to support the outcome competition, managers could initiate ideation contests and deliberately give employees more responsibility concerning their own ideas (Beretta, 2019; Nicholson, 2015; Zhu et al., 2019). Also, managers should promote employees' self-efficacy, for instance, by keeping innovation barriers as low as possible or by establishing a culture in which employees are allowed to fail (Bandura, 1997; Bandura, 2012; Kruff et al., 2018).

Third, we draw managers' attention to some aspects of platform design that, according to this study, may contribute to innovative behaviour. Managers should regularly or at least initially ask employees via the platform why they intend to innovate, in other words, what their desired outcomes of innovative behaviour are. If platforms are then programmed to align flexibly and automatically to these employees' desired outcomes and consciously address them, they can specifically target the various motivational forces to maximize each participant's motivation (Reiss, 2004; Vroom, 1964). For instance, if an employee seeks exploration, the interface should provide them with exploration tools and opportunities. If they wish to tackle challenges, the platform should point out challenges and link interested employees with one another.

## 6.3 | Limitations and further research

While contributing to research and practice, this study has limitations that open further research possibilities and provide opportunities to

gain deeper insights into the motivational process of innovative behaviour via online ideation platforms. First, although we conducted a two-study design, the results are cross-sectional and cannot prove the causal nature of the investigated mechanisms. Second, examining platform exposure and subsequent motivational factors can only explain part of the platforms' effects on innovative behaviour. There may be other direct or indirect effects, such as knowledge exchange or workshops (Troise et al., 2021), which may further affect the relationships between platform exposure, motivation and innovation behaviour. Further studies can provide a broader picture to fully explain the mechanism. Third, the data originate from one company. Although the firm is active in several industries and countries, the findings might not translate to small- and medium-sized companies. However, we investigated individuals' psychological effects in the context of digital platforms. Therefore, we argue that the findings provide a more general understanding of innovative behaviour on digital platforms beyond this company's context. Fourth, guaranteeing respondent's anonymity somehow limits our information about their demographic characteristics and thus potential control variables to increase the findings' robustness. However, the two-study approach provides a broader perspective and cross-validates part of the relationships with different samples.

This study's results open up multifaceted avenues for further research, which also concerns the generalizability of the results. In addition to testing the results for other types of companies, it might be interesting to investigate how the results transfer to different types of platforms, such as open innovation platforms (Hossain & Islam, 2015). Unlike firm-internal online ideation platforms, open innovation platforms are accessible by the general public, who can participate in the ideation process. The results may still be directly transferable because the motivational factors from Table 1 relate to general innovation behaviour. However, opening a platform to the public significantly changes the boundary conditions and, for example, increases the likelihood of deviant behaviour (Gatzweiler et al., 2017). Future research should further explore the motivational causes associated with these boundary conditions.

## DATA AVAILABILITY STATEMENT

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

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