

## Gamification of Online Idea Competitions: Insights from an Explorative Case

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**Abstract:** The implementation of game mechanics (like points or leadersboards) in a serious context is called “gamification”. In this explorative analysis of a single case participants of an online idea competition were asked about their motives for participation, flow, enjoyment, task involvement and their perception of game mechanics with respect to flow, enjoyment and task involvement. The results indicate that game mechanics may be a solution to address the main challenges of online idea competitions. However, the analyzed case illustrates also that if game mechanics are applied inadequately and unsophisticatedly they are not able to unfold their potential.

### 1 Introduction

The last decade is characterized by a shift from a company-centered innovation [Ch03, NBM09] to an open innovation approach [Sh06, Ts01, Ch03]. The integration of customers, specifically, offers companies a possibility to improve the innovation activities and the probability of success. Therein, the use of online idea competitions has been proven to be a sophisticated approach [FS03, FP04, Wa07].

As online idea competitions increase in popularity companies face two challenges [Fü10]: Companies have to motivate customers to participate and have to provide an online environment that ensures a high quality of submitted ideas [WG06, Wa07]. In this context the importance of enjoyment and flow has been recognized [PK09, LV02, Fü10]. Implementing principles and mechanics of games (like points, leaderboards or levels) in a serious context is called “gamification” and illustrates one possibility to increase the level of enjoyment and flow and hence, to address these challenges. The relationship between play and creativity has been shown especially in the field of social sciences [RRC99, Da80, Hu55, Pi62]. Its application in the field of innovation management is, however, still at the

beginning [MR06, SRV09]. Therefore, the aim of this study is to shed further lights on gamification of idea competitions and to derive implications.

## 2 Theoretical Background

### 2.1 Idea Competitions

Idea competitions are one possibility to integrate customers into the early phases of the innovation process. They can be described as an invitation of an organizer (like a company, university, museum or federal ministry) to submit ideas for a specific topic. Duration of these competitions is predefined and last usually for a few weeks [Wa07, Mc00]. Submitted contributions are evaluated by an (expert) jury, by peer review or by self-assessment [PW06]. After closing the competition and evaluating contributions winners are announced. Fuller [Fü09a] notices an almost “inflationary increase” of idea competitions in the last years: Organizations, respectively brands such as Adidas, Henkel, IBM, Bombardier, Cisco, Dell, 3 M, Spar, Deteccon, Google, Lego, Toyota, BMW, Melitta, Microsoft, Starbucks, Ideo, Rocher, Samsung, Tchibo invited users to give their input between the years 2004 and 2011. Main driver of this development is the Internet. It enables an easy exchange of ideas and a direct interaction of organizations with customers. Thus, intermediaries like market research can be bypassed [SVP05, PW06]. Along with the “inflationary increase” [Fü09a] of idea competitions, pressure on organizers grows to meet the two core challenges: How can more and better users be encouraged to participate and how can creativity of innovators be inspired, respectively the quality of ideas be enhanced [To06, PW06]?

Companies try to motivate idea competition participants with extrinsic rewards like money, monetary compensation [Wa07] or firm recognition [JF06]. However, research in social psychology indicates that extrinsic rewards might have a negative effect on motivation and creativity [To06]: They can inhibit or even diminish people’s behavior [DKR99] and can have detrimental effects, when complex and creative tasks have to be performed [Sp56, Mc78a]. McGraw [Mc78b, p. 34] highlights, that rewards are detrimental, when they are either “a superfluous source of motivation” or the possible solutions to a task “are not immediately obvious.” Consequently, it is necessary to enhance the web-based experience of idea competitions [e.g. Le09, ABM10, Fü06, BSS07, PW06] to intrinsically motivate and engage participants due to interest, joy, self-expression and curiosity [Am93, Va80]. When persons are intrinsically motivated they can even be in a state of energized focus (flow), involvement and enjoyment [DR85, Cs90].

### 2.2 Play

Sandelands [Sa10] supposes that people play for their own reason or good. This is reflected in scientific literature in which a multitude of reasons can be found ranging from aspect of socialization [e.g. Vy33] to the simple and most obvious experience of enjoyment [Ab90]

and, consequently, being happy. However, there is no common understanding and definition of play and some authors even state that play cannot be defined [GAD02, BV09, Su97, Na90]. Literature review also reveals a multitude of possible characteristics of play and games: Huizinga [Hu55], for example, argues that play is bounded in time and space, is a free activity, has rules and promotes socialization. Falassi [Fa87] points out that people behave in games, as they would normally not do. Caillois [Ca61] sees play as an enjoyable and voluntary activity. Thornton and Cleveland [TC90] consider interactivity as an important feature of games. De Felix and Johnston [DJ93] cite structural components like dynamic visuals, goals, rules and interaction as essential aspects. Baranauskas, Neto and Borges [BNB01] outline, that games are an activity of challenge and risk. And Crookall, Oxford and Saunders [COS87] mention game aspects like rules, competition, cooperation and chance. In organizations play is underestimated, though it can be considered valuable in many contexts: Play can improve productivity in the workplace [SW91] and enhance decision making [SRV09]. Dickey [Di07] and Cooper et al. [Co10] showed that multiplayer online games can facilitate learning or can help solve scientific problems. But there is only little research [e.g. FÜ10, To06] on the boundaries of play and idea management [MR06]. This is remarkable as play can yield to both creative output [e.g. Li77, RG90] and intrinsic motivation [SW05]. Thereby it can offer an experience of flow, involvement and enjoyment that can last for hours [SW05, Ku09]. In this paper the authors argue, that play can be applied to idea management systems by integrating game mechanics. According to Birke, Witt and Robra-Bissantz [BWR11], game mechanics are defined as features that originate from games. They can be used to make idea management a game-similar experience. Examples are verbal feedback, redeemable points, game points, social points, levels, leaderboards, stories, customization, exchanges or collecting. Thus, the application of play can provide a solution to the core challenges that idea competitions face.

### 3 Empirical Study

#### 3.1 Background

For years the European automotive industry is trapped by innovation pressure. There are several important drivers for this development. The most important ones are saturation of consumption in core markets like Central Europe, United States and Japan, increasing international competition, rapidly changing environmental objectives respectively regulations and growing customer demands (for performance, design, comfort, entertainment, safety and fuel economy) [e.g. Ka03, Di06]. As a consequence OEMs have started to open their innovation process. BMW, Daimler, Peugeot, Renault and Volkswagen used online idea competitions to get ideas from external sources like customers. Table 1 illustrates the inflationary increase of online idea competitions organized by the mentioned OEMs in the last two years.

Name	OEM	Starting Year	Topic
Connected Drive	BMW	2002, 2007	Ideas for driver assistant systems, telematic and electronic services
Interior Idea Contest	BMW	2010	Ideas for the interior of cars
Design your smart	Daimler	2010	Ideas for the outward appearance of a smart
Design Contest	Peugeot	2002, 2005, 2007, 2008	Ideas for car designs
Renault 4 ever	Renault	2011	Ideas for the re-design of a Renault 4
Production Award	Volkswagen	2010	Ideas for an electric Audi
Think Blue	Volkswagen	2010	Ideas for energy efficiency projects

Table 1: Idea competitions organized by automotive OEMs

The OEM that organized the analyzed idea competition is one of the biggest multinational companies in the automotive industry. The company produces cars as well as automotive services and has its headquarter in Germany. Core markets are Europe and China. In 2010 it sold over 7 million vehicles. The company is innovation-driven: According to the “2010 EU Industrial R&D-Investment Scoreboard” report [He10] it is one of the top research and development investors in Europe. However, customers are mainly integrated in the late stages of the innovation process. So far, there have been only a few attempts to open the early phases of the innovation process. The idea competition was organized by a single brand of the OEM. It took place in the summer of 2010 over a period of eight weeks. Participants (customers, coders and developers) were asked to submit application-ideas for a future navigation system. Ideas had to be submitted online either in text or implemented form. Ideas in an implemented form could be developed with a toolkit. Nine experts evaluated six weeks after the end of submission ideas according to different criteria. Best ideas were assigned by cash and monetary compensation worth around 10 000 euro.

### 3.2 Game Mechanics in the Analyzed Idea Competition

In the analyzed idea competition three game mechanics were integrated, namely game points, social points and leaderboards. Players get game points by the system for predefined actions [RO05]. In the analyzed idea competitions game points were given for different activities. Users got game points for the contribution of ideas, writing a comment, leaving a message to another member, evaluating an idea or once for uploading a profile picture. Other participants in general award social points. Leimeister et al. [Le09] and Möslein et al. [MHB10] term the rating of ideas and comments by other participants in an idea competition “community rating” or “open evaluation”. Idea contributors in the underlying idea competition could get social points, when participants evaluate the ideas positively in the form of a “thumbs-up” button. Leaderboards (“activity counters”) show players their progress in relation to other players and thus give them feedback about their success chances

[RR09]. In the analyzed idea competition participants also could see their own ranking position in relation to others in six different leaderboards: In a drop-down menu participants could choose one criterion (“number of social points”, “number of comments”, “number of evaluations”, “number of messages”, “number of ideas”, “number of aggregated points”).

### 3.3 Research Questions

The aim of this paper is to shed further light on the effect of game mechanics within online idea competitions. Therefore a twofold procedure was chosen. First, general elements (motives, flow, enjoyment, task involvement) were analyzed to see whether the surveyed competition is comparable to previous studies. Following the interdependencies between game mechanics and flow, enjoyment as well as task involvement were examined.

Deci [De71] argued in 1971 that some activities possess their own inherent reward. The individual engages because of joy, curiosity, self-expression, personal challenge at work and interest [Am93, Va80]. Füller [Fü06] found that customers are engaged in a virtual development project mainly due to intrinsic motives such as “showing ideas” and “curiosity.” Therefore, we propose the following research question:

*Research question 1: What are the main drivers of motivation within this online idea competition?*

Deci and Ryan [DR85] argue that being intrinsically motivated can sometimes even lead to the experience of flow. Csikszentmihalyi [Cs90] identifies the following elements that can accompany this experience: A task has clear goals and can be completed; ability to concentrate is needed to solve the task; direct and immediate feedback is given during an activity; individuals have a feeling of control over the actions; there is a loss of the feeling of self-consciousness; sense of time distorts; persons lose awareness of daily worry and frustration. By this, people face at the same time a lower level of reservation towards their own abilities and skills, and become more motivated to submit ideas. Flow is thus an important aim in idea competitions to increase the level of motivation. Therefore, we propose the following research question:

*Research question 2: Is flow fostered within the analyzed online idea competition?*

According to a number of authors the interaction experience will be essential for the success of open innovation initiatives [e.g. Fü06, Le09]. Companies have to offer customers a compelling experience, which permits the expression of enjoyment [PK09]. This leads to the following research question:

*Research question 3: Do participants within this online idea competition experience enjoyment during the competition?*

Another construct that determines a positive interaction experience is task involvement. Participants, who perceive an object or an activity as relevant, are involved in that activity or

object. Customers with high task involvement are more focused, feel more competent to make contributions and feel more supported by the idea competition tool [Fü09b, Fü10]. Hence, we propose the following research question.

*Research question 4: Does participation within this online idea competition lead to task involvement?*

Game mechanics shall make idea management systems to games or to a game-similar experience [BWR11]. By that, idea management systems may become more motivating and with the closer proximity to games contribute to the degree of happiness during the competition. Hence, it is examined what attitude participants have towards the applied game mechanics. Furthermore it is analyzed whether and in which way interdependencies between flow, enjoyment and task involvement on the one side and game mechanics on the other side exist. As a consequence, we propose the following research questions.

*Research question 5: How do participants perceive game mechanics?*

*Research question 5a: How is the perception of game mechanics with respect to motivation?*

*Research question 5b: How is the perception of game mechanics with respect to the degree of happiness?*

*Research question 5c: Are there interdependencies between game mechanics and flow, enjoyment as well as task involvement?*

### **3.4 Methodology**

For the purpose of this study, a quantitative analysis on basis of an online survey was conducted. The questionnaire consisted of three parts. The first part addressed personal information such as gender, age, country and level of education. Next, general questions regarding previous experience with idea competitions as well as design and programming skills were asked. The third part comprised aspects related to the competition itself and the perception and evaluation of the competition. Therein the variables for flow were orientated on Walcher [Wa07], task involvement and enjoyment were orientated on Füller [Fü09b]. Variables regarding game mechanics were determined by the design of the underlying idea competition. These variables were measured on a five-point Likert-scale ranging from “strongly agree (1)” to “strongly disagree (5)”. Regarding the motives for participation, an open question was used. Answers were following subsumed under categories. The data were mainly analyzed with frequencies and crosstabulation with respect to the small sample. Partly correlation analysis is conducted. The prerequisite of interval scaling was ensured in the formulation of questions, while the prerequisite of normal distribution was tested with the Kolmogorov-Smirnov-test. All items with the exception of enjoyment were normally distributed. Thus, the Pearson correlation coefficient or the Spearman rank correlation coefficient was applied according the (non-) existence of normal distribution.

## 4 Findings

The survey was carried out from July 6<sup>th</sup> 2010 to August 6<sup>th</sup> 2010. Almost 530 participants of the idea competition were contacted via mail. From these 55 followed the link to the questionnaire. 30 questionnaires could be used for the analysis. This represents approximately 6% of all participants in the online idea competition. The sample comprised 28 male and two female respondents. 12 respondents completed a bachelor or a master's study, two finished high school, two earned a PhD and two did not specify their achieved educational level. Furthermore, a somewhat mixed picture regarding the age characterized the sample. The youngest respondent was 19 years of age while the oldest was 57 years old at the time of the survey. The median age was 26 years. Germany was with 10 participants the mode regarding the country of origin. Five respondents were from India. From Russia, Egypt and Italy were two participants for each. From Spain, China, Romania, Portugal, Mexico, Brazil, Turkey, Canada and Israel was one respondent for each. The majority of respondents took part for the first time in an online idea competition. Seven stated that they had already participated in one idea competition and three had participated so far in more than one idea competition.

### Motives for participation

The usage of existing knowledge and curiosity illustrated the most important motives for participation. Reward-driven and therewith extrinsic in nature was with four responses the third most important motive and subsumed elements such as monetary or self-promotional aspects. Overall, it could be concluded that the participation was mainly driven by intrinsic motives (see Table 2).

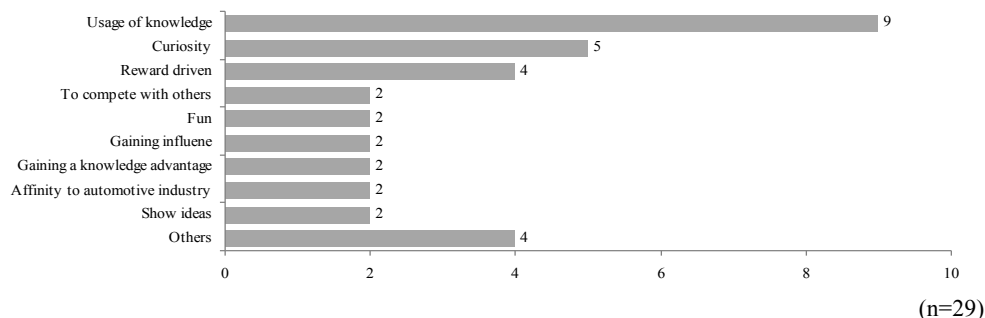


Table 2: Motives for participation

### Flow

The items regarding flow support prior findings [e.g. FÜ06] as they indicate as well that the participants started to be immersed into the competition. They tended to feel that time passed quickly and were not easily distracted and felt content when developing ideas (see Table 3). Simultaneously, they tended to think about other things than the task given.

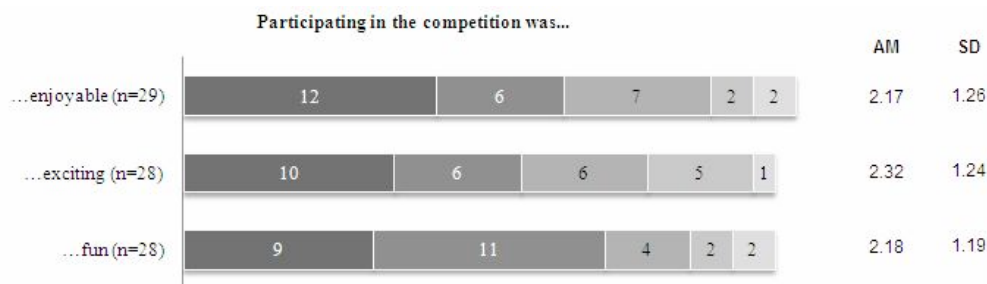
Flow	Statistics	
<i>Time passed quickly for me during the task performance. (TPQ) (N=30)</i>	AM=2.30	SD=1.119
<i>The development of ideas made me feel content. (DIC) (N=30)</i>	AM=2.13	SD=1.008
<i>I thought about other things than the task during the participation. (TAO) (n=29)</i>	AM=2.79	SD=0.978
<i>I was distracted from the activity during the participation. (DA) (n=29)</i>	AM=3.48	SD=1.022

Scale: Five-point Likert scale with answers from “strongly agree (1)” to “strongly disagree (5)”

Table 3: Flow

### Enjoyment

The majority of participants evaluated the participation in the competition positively. All three enjoyment items surpassed an approval rating of more than 50%. In the items “enjoyable” and “exciting” the mode was the highest degree of agreement (see Table 4).



■ Strongly agree (1) ■ (2) Agree ■ Neither agree nor disagree(3) ■ (4) Disagree ■ Strongly disagree (5)

Five-point Likert scale with answers from “strongly agree (1)” to “strongly disagree (5)”

Table 4: Enjoyment

### Task involvement

The results of enjoyment were also reflected with respect to task involvement. The values of all four items showed a medium to full agreement to the statement that the generation, development and evaluation of novel ideas was enjoyable, interesting, stimulating respectively exciting (see Table 5). The mode for all four variables was the tendency to agree and not more than three people tended to disagree or completely disagree with the statements. The items were, in addition, significantly correlated with the enjoyment items “enjoyable” and “exciting” (Pearson corr. coeff.: 0.379 – 0.724;  $p < 0.05$  (2-tailed)). The items “exciting” (Spearman Rho = 0.440) and “interesting” (Spearman Rho = 0.412) were significantly ( $p < 0.05$  (2-tailed)) correlated with “enjoyment.”



Task involvement	Statistics	
<i>It is enjoyable to generate, develop and evaluate new ideas on online idea competitions. (ENI) (n=29)</i>	AM=1.90	SD=0.860
<i>It is interesting to generate, develop and evaluate new ideas on online idea competitions. (INI) (n=29)</i>	AM=1.97	SD=0.981
<i>It is stimulating to generate, develop and evaluate new ideas on online idea competitions. (SNI) (N=30)</i>	AM=2.17	SD=1.085
<i>It is exciting to generate, develop and evaluate new ideas on online idea competitions. (EXNI) (N=30)</i>	AM=2.17	SD=1.085

Scale: Five-point Likert scale with answers from “strongly agree (1)” to “strongly disagree (5)”

Table 5: Task involvement

### Game mechanics

The perception of game mechanics within the idea competition was mainly characterized by the tendency to evaluate its effect less strongly, which is mainly due to the effect of evaluating the statements in majority with the value 3 resp. “neither agree...nor disagree.” Respondents tended to state that the influence of an increase or a decrease of the activity counter had only a minor effect on the motivation to introduce further ideas or on their level of happiness (see Table 6). However, only a small minority of respondents did not pay attention to the activity counter itself (n=6) or took a look at it only seldom (n=2). Ten respondents checked the activity counter at least once per week and eight did this even daily. Ten respondents agreed with the statement to have started to check their points more often during the competition.

Game mechanics	Statistics	
<i>Gaining points made me happy. (GPH) (n=27)</i>	AM=2.74	SD=1.259
<i>The allocation of points was comprehensible. (AP) (n=28)</i>	AM=2.96	SD=1.138
<i>Gaining points increased my motivation to introduce further ideas. (GPM) (n=28)</i>	AM=2.96	SD=1.201
<i>During the competitions I have started to check my points more often. (CP)(n=27)</i>	AM=3.04	SD=1.427
<i>The decrease of my ranking in the activity counter made me feel less happy. (DRH) (n=28)</i>	AM=3.21	SD=1.315
<i>Improving my ranking in the activity counter made me feel happy. (IRH) (n=28)</i>	AM=3.21	SD=1.287
<i>Improving my ranking in the activity counter increased my motivation to introduce further ideas. (IRM) (n=28)</i>	AM=3.29	SD=1.329
<i>The calculation of the activity counter was comprehensible. (CA) (n=28)</i>	AM=3.32	SD=0.945
<i>The decrease of my ranking in the activity counter lowered my motivation to introduce further ideas. (DRM) (n=28)</i>	AM=3.32	SD=1.389

Scale: Five-point Likert scale with answers from “strongly agree (1)” to “strongly disagree (5)”

Table 6: Game mechanics

### Flow and game mechanics

The comparison of flow (TPQ, DA, TAO, DIC) and GPH shows, that those participants who agreed with the statement to be content while developing new ideas (DIC), agreed also in

majority with the statement that gaining points made them happy. In addition, the majority of participants, who stated that gaining points made them happy, felt that time passed quickly during the task performance (TPQ). Simultaneously, persons, who stated that they were distracted during the participation (DA), agreed in a majority that gaining points made the happy. If respondents stated to have not thought about other things during the participation (TAO), they disagreed with GPH in majority. The just described tendency in the responsiveness could also be found in a similar way in the comparison of DIC, TAO, DA and the item "Gaining points my motivation to introduce further ideas" (GPM). The response behavior here was characterized by a majoritarian agreement with GPM if participants also agreed on the flow-items. The evaluation of statements between AP and all flow-items shows that participants assented in majority with AP if the experience of flow was assented. The statements towards the calculation of the activity counter differed from the former finding only in the item TAO. Here the evaluation of both items was opposing. The response behavior with respect to flow and IRH was mainly characterized by contradicting evaluations. If participants agreed with the flow items they disagreed predominantly with IRH. For TPQ and IRH no tendency could be found. With DRH, IRM and DRM the picture was even clearer as participants who affirmed the flow items, disagreed with the statements to the game mechanics in majority.

#### **Enjoyment and game mechanics**

If respondents agreed that the participation was fun, exciting and enjoyable, they also agreed in majority with the statement that gaining points made them happy. It appears in the examination of GPM and enjoyment that, if participants assented the items of enjoyment, they disagreed in majority with GPM. By comparing the items fun and exciting of enjoyment with CP it could be found that people agreed in majority with the statement to have started to check their points more often during the game if those answers are taken into consideration, which agreed with these enjoyment items. In matters of the item enjoyable no tendency could be found as the same number of people agreed and disagreed with the statement to CP. The responses concerning AP shows that participants evaluate the allocation of points comprehensible in majority if they perceive the participation as fun exciting and enjoyable. The calculation of the activity counter, however, showed the tendency that the majority of respondents disagreed with its comprehensibility, if it was agreed with the items of enjoyment. The evaluation of IRM, DRM, IRH, DRH was characterized by a majoritarian disagreement if the enjoyment items are agreed with.

#### **Task involvement and game mechanics**

Gained impressions in flow and enjoyment were confirmed in the comparison of task involvement and game mechanics. If the positive statements about SNI, ENI, INI were taken, participants agreed in majority with the statement that gaining points made them happy. In the task involvement item "EXNI" it could be found that most respondents disagreed with GPH. If INI and SNI were positively rated, it was mirrored by a positive evaluation of GPM

by the majority, whereas mainly opposing evaluations to GPM in ENI and EXNI described the response behavior. Were the generation, development and evaluation of ideas rated as stimulating, enjoyable and interesting, participants agreed in majority that they had started to check their points more often during the game. In the comparison of task involvement items and the allocation of points the majority of responses agreed with the comprehensibility if those answers to task involvement were considered, which agreed with the statements. The calculation of the activity counter, however, was seen as not comprehensible, if the positive evaluations of task involvement items were taken. The same applies to DRH, IRH, DRM and IRM.

## 5 Discussion and Future Research

The findings of this study offer first hand insights into the effect of game mechanics within an online idea competition. However, it has to be borne in mind that this study faces several limitations. With 30 questionnaires the sample is very small and does not fulfill the requirements of representativeness. In addition, only one specific competition was analyzed. Within the competition only a few game mechanics (points, activity counter) were applied. The application was not regarded as essential component in the definition and architecture of the idea competition and was thus not in the main focus during the development of the online competition. It seems to be something of a first try to gain experience with game mechanics. The game mechanics were subsequently not implemented in a sophisticated way. As a consequence of these limitations, the study is explorative in nature and all findings are in the area of tendency statements.

The participation was in concordance with prior studies [e.g. Fü06] mainly driven by intrinsic motives. Participants tend to agree that flow is fostered by the idea competition, that they enjoyed the task and that they were immersed into the task. Regarding the evaluation of the game mechanics in general it has to be stated that perception of them is not as strong as expected and the degree of agreement is lower than expected. An explanation for these findings is probably the way game mechanics were used in the competition. Leaderboards were difficult to find, they were confusingly presented, the calculation was unclearly described and that the presentation was not adjusted to the individual participants on the website. This is supported by the statements regarding the calculation of the activity counter and the effect of increase or decrease of the own ranking in the activity counter itself if mirrored with agreeing statements to flow, enjoyment and task involvement. Almost exclusively all participants who stated to have experienced flow and enjoyment and were immersed, disagreed with a statement that an increase or decrease of the own position in the activity counter had any effect on the motivation or the degree of happiness. However, there are a number of hints that game mechanics can be a promising and fruitful solution for existing problems in online idea competitions. In all three constructs (namely flow, enjoyment and task involvement) the item "gaining points made me happy" was in majority agreed with if compared with positive statements towards the single items of flow,

enjoyment and task involvement. Simultaneously, there is the tendency that those participants who agreed with the statements to flow, enjoyment and task involvement started to check their points more often during the competition. Regarding the statements to flow there is, furthermore, an indication that gaining points motivated to introduce further ideas.

In conclusion, the analyzed idea competition offers hints what positive effects the implementation of game mechanics may have and what may happen if game mechanics are implemented in an inadequate and unsophisticated way. Their potential is simply not accessible and thus cannot offer an important contribution to the success of an online idea competition.

Further studies have to test on a larger scale basis game mechanics to confirm or disprove the effect of its effects. Therein, future research could analyze whether differences between different categories of participants (novices vs. experienced, gender) and between different industries exist.

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