Sparking Motivation and Creativity with "Online Ideation Games"

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Abstract: In the context of innovation management organizations face two challenges: they must provide motivation for users to participate and they must inspire users to make creative contributions. One activity, which leads to motivation as well as creative outcome, is play. The paper aims to clarify if playing a multiplayer online game can motivate to generate creative ideas for real-world problems. Using ready-made software ("SCVNGR") and adopting the method of experimental prototyping, we therefore developed a multiplayer "online ideation game" (OIG). The OIG was launched as a pilot at a large German university to generate new ideas for improving its services and infrastructure. 77 students took part in the game, although no extrinsic rewards (like marks or monetary compensation) were promised or given. 34 players were surveyed using an online questionnaire. To evaluate the creativity of ideas experts were interviewed using consensual assessment technique. Four motivational factors could be extracted, which explain why individuals played the game: a) receiving feedback and sense of accomplishment, b) dissatisfaction with existing services, c) learning and d) achievement. Results also indicate that players were highly involved and learning is the main driver of players' involvement. Overall, experts rated creativity of the ideas generated by the players as high.

1 Introduction

Empirical evidence shows that organizations benefit from users who engage virtually in idea generation (ideation). Users help organizations in acquiring information about preferences, requirements and needs, and thus assist in the decrease of failure rates of new product introductions [DH02, JF06, MVI01]. Online tools especially, enable organizations to open their innovation process to user input, and activate a broad public for ideation. Examples of such tools include idea competitions [PW06], toolkits [vH01] and communities [FS03, Fi09]. Researchers such as Füller [Fü09a, Fü10a] have observed an "inflationary increase" in the use of these tools and emphasize that organizations face the following two significant interconnected challenges. Firstly, online tools must be created in such a way that users are motivated to choose ideation tasks and put effort in doing that task. Therefore, participant motives must be triggered

and involvement must be evoked. Individuals with high involvement expend effort in performing ideation tasks and persist longer with that effort [Fü09b]. Secondly, users must be inspired to make creative contributions, as creativity is the main prerequisite for the user ability "to make valuable and innovative contributions to a firm's new product development process" ([Fü10a], p. 104).

One activity which leads to high motivation, involvement as well as creative outcome, is play (e.g. [DR85, Be69, Cs75, Ga86, Mi73]). There is little agreement on how to define the activity of play [Su97]. Cooking and driving may sometimes be considered play, but not always. Writing and designing are also play for some individuals but not for others [MR06]. However, a common set of elements exists which brings individuals to perceive an activity as play. Some authors argue that play gives clear challenges (e.g. [Cs75, Ma80]). Starbuck and Webster [SW91] point out that play is a behavior that is encouraged through immediate and continuous feedback. Caillois [Ca61] states that play has no external constraints, but has internal constraints (like fixed rules) which are accepted by players. Crookall Oxford and Saunders [COS87] name competition as a further characteristic of play. Schell [Sc08] circumscribes play as a problem-solving activity with a fun attitude. The influence of play on creativity and motivation has been widely recognized; as neuro-scientific studies indicate that play is an important elicitor of human behavior and is responsible for the emission of neurochemicals that influence the development of the social brain and the neural network (e.g. [GK07, PB03]). Authors from social science and psychology (e.g. [Da80, HTS02, Ru03]) propose that play is the first creative act of a child and involves free association, fluidity of thinking and mental transformation. These authors also show that play allows the relief of negative affect and results in positive affect (like enjoyment and relaxation). Philosophers such as Kant [Ka50] or Lasker [DS01] defined play as the connection between experience and thinking. They stated that someone has to play in order to do valuable work. Organizational literature demonstrates that play can help to improve the product design process [Sc00], can engage people in learning [SRV09] and can engage people in strategy development processes [JH06]. However, only little research has been devoted to the boundaries of play and idea management respectively open innovation [MR06, St08].

This paper aims to discuss a new method to integrate users into idea generation: a multiplayer online ideation game (OIG). An OIG gives players the opportunity to solve real-world problems within an online game. Thus, it follows the idea of "games with a purpose, i.e., games that are fun to play and at the same time collect useful data for tasks that computers cannot yet perform" ([HA09], p. 2). This exploratory approach is based on piloting and evaluating an OIG which took place at a German university in winter term 2010/2011. The evaluation of the game is threefold. Firstly, we examine the motives responsible for playing. Secondly, we analyze the degree of players' involvement and identify its main driver. Thirdly, we investigate the degree of creativity of ideas generated by the players.

2 Foundation: Review of research and practice on OIGs

Online games used to integrate individuals into the process of ideation have so far been almost completely ignored in scientific research. One possible explanation for this lack of research is that play has been viewed as useless or even dangerous for serious adults since the dawn of the Industrial Revolution [Sp89]. Play and work were described as two opposing sets of activities [MR06]. From this perspective an online *ideation game* would be an oxymoron: according to Caillois [Ca61] play is non-productive and separate from the real world. However ideation is typically undertaken to achieve a specific outcome (the generation of creative ideas), and relates to the solution of real-world problems. Thus, the concept behind the creation of an OIG would appear to conflict with critiques of the early days of game-based learning [GAD02]. However, some researchers [HA09, Fü10b, Co10] recently argue that online games have the potential to motivate people to deliver useful data.

In recent years, a number of OIGs have been applied practically to solve real-world problems. OIGs can be classified with respect to the following two design elements:

- **Mission specificity.** OIGs provide players with missions to solve. Mission topics can be either very specific or very broad. An example of a game with very specific missions is Foldit (www.foldit.com). Players fold proteins to optimize the computed energy. Thus, players help to generate ideas for the folding of proteins, which can be a potential source for vaccine [Co10]. An example of an OIG with very broad missions is Evoke (www.urgentevoke.com), developed on behalf of the World Bank Institute. In Evoke, players develop ideas to solve urgent social problems like disease, hunger, poverty, conflict and climate change [Mc11]. Another example for an OIG with broader missions is the game MMOWGLI (www.mmowgli.nps.edu). With help of this game, the US navy aims to obtain ideas relating to how to deal with piracy in the Gulf of Aden.

- **Duration.** While some OIGs do not have any time limit, others have a predefined duration. Foldit is one example of a game without any time limit [Co10]. The "Breakthrough to Cures" (http://breakthroughstocures.org) OIG on the other hand, only has a duration of 24 hours and must be completed within that time limit. This game targets the motivation of players to generate ideas about the change of the medical research system and drug development [Mc11].

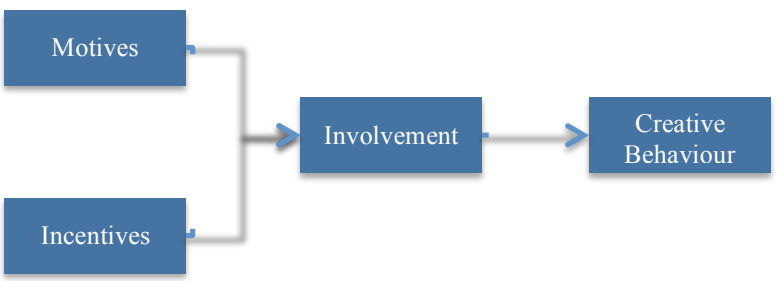
So far, our understanding about what participants expect from their engagement in online ideation games is limited. Little is known about why players involve in such games. Social exchange theory has proven valuable in the analysis of motives in the context of user innovation and also can help to explain why players involve in OIGs. According to this theory humans behave the way they do, because they expect that doing so will offer them a benefit.

Drawing on literature of motivation research found in fields of user innovation (e.g. [Fü06, Fü10a, FS03, Wa07]) and games (e.g. [Ye07]), various reasons can be identified why participating in OIGs offers a benefit. Players might generate ideas for

organizations, because they want to get recognition (GR) from peers and organizers (e.g. [JF06, FS03, Wa07]). Participants may be motivated because of the desire to support (SU) the university or other students [Fü06]. They may also take part to learn something new and develop their skills (DS) [SB11, AMA10, Fü06]. Antikainen Mäkipää and Ahonen [AMA10] proposed that users innovate to obtain a sense of efficacy (SE). Other motives include pursuing the opportunity to "get to know" people (KP) and having the feeling of "social belonging" (SB) [Ye07, Ko02, RG04, AMA10]. One other reason why users may engage is because they want to "keep up" (KU) with new ideas [Fü06]. "Curiosity" (CU) may lead to motivation for participation [Fü10]. "Personal need" (PN) may be also a motive to participate [RG04, JF06, HO02, LW05, FS03]. Persons may participate because they hope for a "reward" (such as monetary compensation) (RE) [WF00, LW05, Ye07] shows that people play online games, because they want to "escape from the world, stress and boredom" (ESB), to "compete" (CO) with each other and to "understand the game and its mechanics" (UGM). Naturally, players [Ye07] and user innovators [vHK03] may engage, because they are intrinsically motivated, enjoy solving puzzles and try to gain the "feeling of fun" (FU) during the activity.

It is important to know what people expect from online ideation games as users are only willing to contribute creative ideas if their expectations are met. They only volunteer their time if they consider the game-experience rewarding. More insight is needed because online ideation games are bearing the risk of evoking little interest in participation and consequently not enhancing creative contributions. The investment for companies offering online ideation games may be lost if participants' expectations are not addressed.

In literature, several frameworks can be found that help us understand the interaction between motives, involvement and creativity. Our framework is shown in Figure 1 and is based on Amabile et al.'s component model.



3 Methods and data

Although OIGs are already in use in practice, no research has examined the motives of players, their degree of involvement and the degree of creativity of generated ideas. This paper aims to close this research gap. Therefore, an OIG called "Campus Game" was implemented and tested at a large German university. In this game, players (more

specifically students) generated ideas for new services and for infrastructure improvements at the university.

3.1 Research process

Initially we identified four "experts" by a pyramiding-approach [Bi95]. Persons were classified as "experts" if they worked for the university and had exclusive knowledge about its complaint and innovation management. "Experts" also needed to have access to information about areas in which new ideas were needed in the university environment. The interview with the experts was threefold: First, we interviewed the experts in relation to the existing university's innovation process and students' motivation to contribute ideas for the improvement of the university's offer. Second, we asked the experts to name conditions, which the OIG "Campus Game" was required to meet. Third, we asked them to formulate possible mission topics. The face-to-face interviews were transcribed and evaluated following the procedure suggested by [Yi08]. Following the interview process, we developed the "Campus Game" using the concept of experimental prototyping [Gi02, Ma02, Ho11]. Experimental prototyping is a typical method in the preproduction phase of a game development process; it facilitates testing the game to receive input about its design idea. In addition, experimental prototyping permits the observation of the behavior of potential players [Ho11]. According to [Ma02], the use of ready-made software for game prototyping is a promising approach. Therefore, the ready-made software "SCVNGR" was used for the Campus Game-pilot. SCVNGR (www.scvngr.com) is a platform which facilitates the creation of a multi-player game. During a short pre-test phase of two weeks the functionality of the software was tested and the practicality of missions was improved, after which the pilot was launched. The game had a predefined duration of 59 days between the 3rd of December 2010 and the 30th of January 2011. During this period, 104 students of the university registered for the game. Of those students, 77 played the game, although no extrinsic rewards (like marks or monetary compensation) were promised or awarded. Subsequently, players were asked regarding their motives and involvement via an online questionnaire. Finally, an expert jury evaluated the 73 ideas generated while playing, which related to new services and infrastructure improvements at the university. For evaluation, Amabile's Consensual Assessment Technique (CAT) was used [Am82, Am96].

3.2 Research background: The "Campus Game"

Due to increasing mobility of students, the Europeanization of higher education and growing number of colleges and universities, students in Germany have a much higher awareness of their right to receive a good product [Gu10]. Thus, it is essential to integrate students in ideation to improve the products which universities offer [Wi02]. The product of universities not only consists of academic teaching, but also of social and physical elements, such as infrastructure [Se96]. To integrate students in the innovation process, the university under investigation launched a blog in February 2009. The blog gives students the opportunity to submit complaints and contribute ideas to improve university's product. However, our interviews with the "experts" (complaint managers

and developers of the corporate blog) revealed that users lacked the motivation to contribute, and consequently the decision was made to pilot an OIG. Experts also identified the following four conditions, which the game was required to meet. All conditions are connected with the aim to evoke motivation and creativity:

- **Allow location-based solution of mission.** Research shows that the motivation and creativity of ideas can be increased when one is confronted with a problem in reality [PMW09]. Thus, a game playable on smartphones was developed. The game was intended to give players missions to solve. These missions were intended to be tied to particular locations on the university campus and solvable at those places.

- **Assign clear missions.** Specific missions enable focus and concentration and thus can have a positive influence on motivation and creativity [HA10, Sh08]. Thus, missions should be clear and be supported by the rules of the game. In these missions, specific areas are addressed where product innovation is needed. The research team and the experts were required to jointly formulate missions.

- **Provoke competition.** Research shows that competition is a main reason why people play [Ye07, COS87]. All named examples for OIGs also encourage playing and inspiring creativity with help of competition between players. Thus, the developed game was required to provoke competition.

- **Induce social belonging.** Social belonging can have a positive influence on motivation and creativity [Am88, PS03]. Thus, the developed game was required to give players the possibility to virtually connect with each other like on a social networking website, to comment on and to evaluate ideas.

For the development of "Campus Game", the conditions, which were identified by the experts, were taken into consideration: "Campus Game" is a "pervasive game". Pervasiveness in the context of online games "means that the game **can be played in different places** and the location can affect the game-play" ([Ho11], p. 104). Designers of a pervasive game aim to give players the feeling that the real world merges with the virtual game world [JW06]. "Campus Game" players may (inter-)act in this world through a smartphone or tablet PCs [Ho11]. Using satellite-positioning players are required to reach five geographically defined locations on campus that are visible on an integrated Google maps API. Upon arrival at one of those locations, students can solve three **clear defined missions**, which refer solely to the specific location: one incremental and one insight problem (type one problem) and one real-world problem (type two problem). The solution of incremental problems require some time to solve, while the solution of insight problems "pop into mind" [SM95]. Type one problems were derived from [WB06]. An example for a type one problem is: "A woman did not have her driver's license with her. She failed to stop at a railroad crossing, then ignored a one-way traffic sign and traveled three blocks in the wrong direction down the one way street. All this was observed by a policeman, yet he made no effort to arrest the woman even though there was nothing stopping him. Why?" ([WB06], p. 1393). Type two problems were jointly formulated by the research team and the experts and related to new services and infrastructure improvements at the university. An example for a type two problem is:

"Students often do not find a car parking place on campus. Get creative and generate ideas for a smartphone-application, which might solve this problem!" Inspired by the games named in chapter two, the campus game **provokes competition** with the help of game points (e.g. MMOWGLI, Foldit), social points (e.g. MMOWGLI, Evoke), leaderboards (e.g. Foldit, Evoke) and badges (e.g. Breakthrough to Cures, Evoke). Players receive "game points" for solving each mission. "Game points" are awarded automatically by the system for the solution of a mission. In addition, players receive "social points" when peers positively evaluate their solution. The winner of the game is the player who has earned the most points. Leaderboards show players how they perform in relation to others in form of a ranking list [HA09]. Badges are either given for the solution of a certain number of missions or for playing the game on particular days unknown to the players. To **induce social belonging** players can "connect" with each other like on a social network website and comment on others ideas. Figure 1 shows exemplary screenshots of the game.

Figure 1: Exemplary smartphone screenshots of the campus game (from left to right: start screen, profile, leaderboard)

3.3 Operationalization, data collection and sample description

The subsections below summarize measure development and data collection of players' motives, their degree of involvement and the relative creativity of generated ideas.

Based on this literature review (chapter 2), 32 motive items were identified. GR, PN, CU, KP were measured with items adapted from [Wa07]. The CO, DS, KP, SU, SE and FU motives were captured with items adapted from [Fü06]. For SB, CO, ESB and UGM, we used [Ye07] measures. Described motives with underlying measurement items are illustrated in the appendix (Table 5). To measure task involvement four items were used developed from [HF89].

To evaluate why 77 persons played the OIG Campus Game and how they were involved in the task, an online survey was used for data collection. A five-point Likert-type scale was applied, anchored by (1) "strongly disagree" and (5) "strongly agree". Based on the approach of Raab-Steiner and Benesch [RB10], a pre-test with 10 participants was performed and followed with an adjusted questionnaire. Data collection with the final questionnaire was conducted within three weeks in February 2011. E-mails with a link to the questionnaire were sent to all 77 players. After two reminder-e-mails, 34 complete questionnaires were returned in total. This corresponds to a response rate of 44.16%. 67.6% of the participants were male, and 32.4% were female. On average, participants were 26.5 years old. 79.41% held a certificate of qualification for university matriculation and 20.59% held a college degree.

The 77 players submitted 73 ideas for the real-world problems in multiple game sessions. Thus, 0.95 ideas were on average handed in per player relating to the type two problems. To assess the creativity of these ideas, we used Amabile's [Am82, Am96] highly regarded CAT (e.g. [KGA04, Ma06, PW06]. According to this method an idea is "creative" when a jury of "appropriate experts" independently agree it is [Am96, PW06]. The number of jury members can vary between three and ten [Am96]. For the evaluation we recruited an expert jury of five persons, who work for the university (dean, complaint manager, referee for tuition fees, head of students union, study coordinator). CAT uses several dimensions to evaluate ideas. We used the following four valid and reliable measurement dimensions [PW06]: "degree of originality", "usefulness for students", "number of expected beneficiaries", "feasibility". Following Baer, Kaufman and Gentile [BKG04] a five-point Likert-type scale anchored by (0) "strongly disagree" and (4) "strongly agree". Guidelines for the execution of the evaluation were taken from Baer and Mckool [BM09]: dimensions are presented, but not explained to jury members. Jury members do not have to justify their decisions. To avoid manipulation, experts were also not allowed to ask any questions. Jury members evaluated all ideas individually and were asked not to speak with other members until the process of evaluation had finished. Experts evaluated ideas in a two-step procedure. Initially, they sorted the ideas in three classes of creativity (low, middle, high). Subsequently, they rated creativity of ideas with help of above-mentioned dimensions [Am82]. Experts were asked to use the full scale [BM09].

4 Results

The 32 motive items ordered according to strength of agreement are illustrated in the appendix (Table 5). To detect a structure behind this large set of motive items an exploratory factor analysis (EFA) was performed [Ba11].

Variables with low Measure of Sampling Adequacy (MSA) (<0.50), low factor loadings (<0.50) and high cross loadings (>0.35) were removed iteratively [Ha10, Ba11]. The remaining 12 items were used to conduct EFA with principal component extraction and varimax rotation. Varimax was chosen to facilitate easier interpretation [Bü10]. The correlation matrix is with a Kaiser-Mayer-Olkin (KMO) of 0.700 suitable for a factor analysis [KR74]. Bartlett's test of sphericity (χ^2=170.717; df=66; sig.=0.000) indicates

adequate application of factor analysis. Also, the criterion of [DS74] is met, as the proportion of non-diagonal elements in the anti-image covariance matrix that are different from zero (>0.09) accounts less than 25%. The scree test was used to define factors [Go74]. Four factors emerged, which explain altogether 76.955% of the variance. Each of the four factors demonstrated good scale reliability with coefficient α's over 0.7 [Nu78]. To test convergent validity, separate EFAs were conducted with all items of one factor. These factor analyses resulted in one-factor solutions and explained variances over 50% [HG96]. Thus, criteria of convergent validity are met. Table 1 summarizes the results of the EFA and contains name of factors, items, factor loadings, explained variances, α's and explained variances of one-factor solutions.

Name of factors and items	Factor loading	Expl. var. (%)	Relia-bility (α)	Validity expl. var. (%)
Receiving feedback and sense of accomplishment		22.028	0.813	73.736
Because I hope other players acknowledge my solutions and ideas.	0.892			
Because I hope to get positive feedback from other players.	0.844			
To gain a sense of accomplishment.	0.831			
Dissatisfaction with existing solutions		19.019	0.810	74.142
Because I think that the university can make students a better offer when realizing my ideas and solutions.	0.893			
Because I think that other students will benefit from my solutions and ideas.	0.895			
Because I have needs, which are not met by the existing universities goods and services.	0.630			
Learning		18.243	0.723	55.498
To keep up with new ideas and innovations.	0.900			
To gain new knowledge/ expertise.	0.789			
I wanted to understand, how the game works and which rules exist to advance within the game.	0.545			
Achievement		17.665	0.745	75.466
I have tried to be the best or better than other players.	0.758			

To improve my skills.	0.651	
To test my capabilities.	0.667	
Total N=34		*76.955*

Table 1: Summary of EFA, reliability and convergent validity

After assessing why the game was played, involvement of the players in the game was measured. Table 2 illustrates the items assessing players' involvement ordered according to strength of agreement.

Measures	Mean	SD	α
Playing the Campus Game is ...			0.669
...interesting.	3.97	0.647	
...enjoyable.	3.81	0.693	
...stimulating.	3.34	0.865	
...exciting/fun.	3.28	0.924	
N=32			

Table 2: Summary of applied measures of players' involvement (five-point Likert-type scale anchored by (1) "strongly disagree" and (5) "strongly agree")

To determine, which motive factor was responsible for involvement a multiple regression analysis was conducted. Therefore, the four involvement items were averaged. As the significant result (Table 3) shows, learning is the main driver for players' involvement.

Independent variables	Dependent variable
	Involvement (Std. Beta)
Factor 1: receiving feedback and sense of accomplishment	0.041
Factor 2: dissatisfaction with existing solution	0.214
Factor 3: learning	0.587*
Factor 4: achievement	-0.06
R^2	0.477
F	5.482*
* $p<0.05$	

Table 3: Summary of regression analysis

As mentioned in chapter 3.3, the quality of evaluation with CAT is high and accordingly reliable when there is high consensus between experts. To measure the consensus, the interclass correlation coefficient (ICC) can be used [WC02]. The ICC builds on Pearson's correlation coefficient and indicates a high degree of consensus, when values are over 0.7 [Am96]. As every expert evaluated all 73 ideas, a two-way model of reliability was chosen [WC02]. In this study, all ICC values were above 0.7 (see Table 4). Therefore, the quality of evaluation is high and accordingly reliable.

Degree of Originality	Usefulness for Students	Number of Expected Beneficiaries	Feasibility
0.764	0.824	0.765	0.825

Table 4: ICC values

By adding the scores of each of the five experts for each single idea, a "creativity score" was built [PW06, Bl10]. The creativity score ranges from 0 to 80 (4 (scale points) x 4 (measurement dimensions) x 5 (number of experts)). The creativity score allows ranking ideas. The idea with the highest ranking has a creativity score of 75; the idea with the lowest ranking has a creativity score of 13 (mean=44.41; SD=16.149). Figure 2 shows the distribution of the ideas according to their creativity score within five-point intervals.

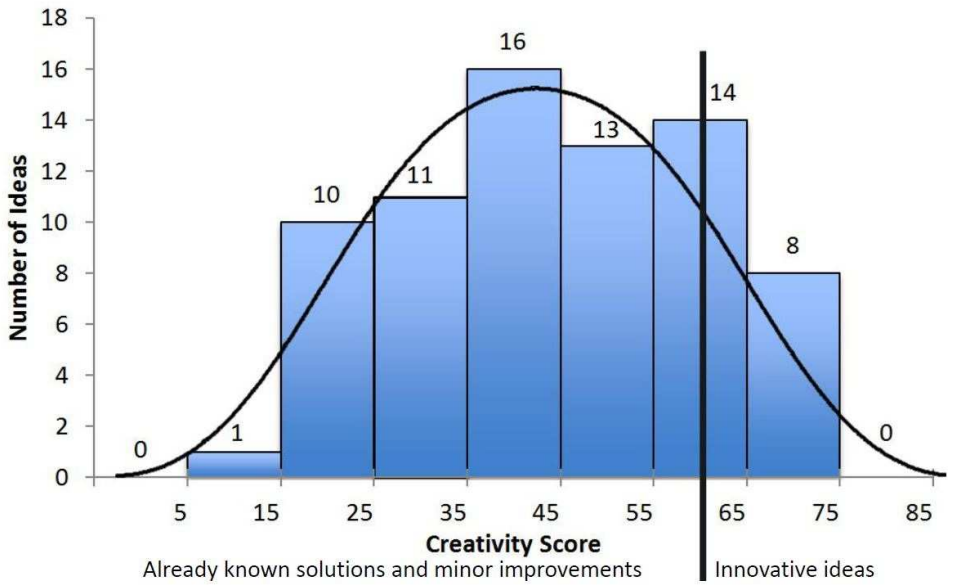


Figure 2: Distribution of ideas according to their creativity score within five-point intervals

The Kolmogorov-Smirnov-Test showed that the distribution is Gaussian and normality of the data can be assumed (p=0.688). 15 ideas (21%) were evaluated as innovative ideas and 58 ideas (79%) were assessed as already known solutions and minor improvements. Thus, the percentage of new and valuable ideas in this study lies above the percentages named in other user innovation projects: [PW06] labeled 10% and [Bl10] 12% of generated ideas valuable.

5 Discussion, limitations and implications

In our research, we presented an OIG as an online tool to empower users. We also outlined why users might engage in such a game. In contrast to other online open

innovation tools, where monetary rewards may determine involvement, users of "Campus Game" principally participated in order to receive positive feedback from other players and a sense of accomplishment. Another driving factor elucidated was dissatisfaction with existing solutions. Furthermore, they wanted to achieve something – absolutely and in relation to other players. Finally, they played because they wanted to learn. Learning was also a major impetus of player involvement. This result accompanies a statement of game designer Ralph Koster ([Ko05], p. 45): "That's what games are, in the end. Teachers. Fun is just another word for learning."

Overall, the involvement of players and the quality of ideas generated in this OIG was high.

Certainly, our study has several limitations. Firstly, this study is exploratory: a new method for user empowerment is introduced and tested on a small scale for a nonprofit organization, specifically a German university. As a result the number of complete returned questionnaires was very small (34). Thus, the empirical analysis should be more regarded as an illustration of a theoretical idea than as an ample proof for the effectiveness of OIGs. Secondly, the data of the CAT stems from interviews with persons, who work for the university. As such, their experiences and their knowledge backgrounds may bias their evaluation. However, despite these limitations, our study allows us to infer practical and theoretical implications.

From a theoretical perspective, the above-mentioned limitations can be a starting point for future research. Further research should strive for generalizations and test OIGs in a variety of contexts. Although such data is difficult to obtain, future studies may gather more comprehensive information by collecting longitudinal information for example. From a design perspective, it may be interesting to investigate how single game features or mechanics effect constructs like "competition", "social belonging", "autonomy" or "affect" and thus motivation and creativity. The issue of how OIGs should be designed is only one out of many interesting research questions. Further examples are: when can an OIG be used? Which users play OIGs? Can OIGs compensate for the additional effort that their realization causes? Thus, further research ought to compare the outcome and effort that the realization of OIGs causes, to other online tools for open innovation. Another interesting question raised is: can an OIG be used to identify lead users?

Organizations which want to profit from OIGs, can draw inspiration from this case, and the practical cases referred to in chapter two. Such organizations face the challenge to design games which achieve the generation of creative ideas, without eliminating what makes them fun and involving. To meet or even exceed the expectations of players organizations have to provide an immersive environment which triggers above mentioned motives. As players want to keep with new ideas, designers have to provide players the possibility to get an overview over (newly) generated ideas. OIG-designers also have to focus on developing game platforms, which give players immediate feedback. Feedback helps players to gain new knowledge and expertise. Thoughtfully implemented game mechanics such as stories, game points, social points and

leaderboards deliver possibilities to provide such feedback. The implementation of levels in form of stages also triggers player's motive of learning: Levels allow players to advance within the system. If these design principles are not addressed in an online ideation games investments of an organisation may be lost.

Along the way to a sophisticated ideation-inside-an-online-game, companies need to experiment, perhaps sometimes with disappointing results. However, this study demonstrates that it might be valuable for companies to use such unpaved road, as OIGs may provide the answer to an urgent, practical question: how can users be motivated to deliver creative ideas?

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Appendix

	Why did you play the Campus Game?	Mean	SD
CU	1. Because I enjoy novel things.	4,09	0,933
CU	2. Because I like to test different things.	4,03	0,937
FU	3. Because I'm generally interested in the solution of tasks/ problems.	3,91	0,965
FU	4. Because I enjoyed to find ideas and solutions for the given tasks.	3,82	0,999
CU	5. Because I like diversion.	3,82	0,983
UGM	6. I wanted to understand, how the game works and which rules exist to advance within the game.	3,61	0,998
ESB	7. I played out of boredom.	3,55	1,092
DS	8. To gain new knowledge/ expertise.	3,50	1,187
ESB	9. I enjoyed exploring the game world and discovering secrets.	3,48	1,029
SU	10. Because I think that other students will benefit from my solutions and ideas.	3,36	0,962
KU	11. To keep up with new ideas and innovations.	3,35	1,152
SU	12. Because I think that the university can make students a better offer when realizing my ideas and solutions.	3,24	0,955
SB	13. I enjoyed seeing me as a member of a player's community.	3,18	1,334
PN	14. Because I have needs, which are not met by the existing universities goods and services.	3,13	1,264
CO	15. I have tried to be the best or better than other players.	2,84	1,273
GR	16. Because I have ideas that I want to introduce to the project managers.	2,76	1,200
PN	17. Because I would highly benefit from the realization of my ideas.	2,73	1,172

SB	18. I rather played in a group than alone.	2,66	0,865
DS	19. To improve my skills.	2,59	1,048
SE	20. To test my capabilities.	2,47	1,261
GR	21. Because I hope the project managers acknowledge my ideas.	2,41	0,979
KP	22. Because I want to meet new people.	2,29	1,115
GR	23. Because I hope to get positive feedback from the project managers.	2,29	1,115
FU	24. For me, playing is rewarding.	2,26	0,864
RE	25. Because I expect a compensation in return.	2,18	1,103
SE	26. To gain a sense of accomplishment.	2,15	0,821
CO	27. I wanted to provoke other players and compare with them.	2,09	1,146
RE	28. Because I hope to win a price.	2,06	0,982
GR	29. Because I hope other players acknowledge my solutions and ideas.	2,06	1,029
GR	30. Because I hope to get positive feedback from other players.	2,00	0,853
ESB	31. I have played to relax from stress.	1,97	1,237
ESB	32. I have played to forget about some of my real-life problems or worries.	1,79	1,083

Table 5: Motive items drawn ordered according to strength of agreement (five-point Likert-type scale anchored by (1) “strongly disagree” and (5) “strongly agree”)