
The inclusion or exclusion of teaching staff in a gamified system: an example of the need to personalize

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Abstract

Gamification is often proposed as a solution to motivate students in an educational context. In this paper, we investigate whether personalized gamification systems tailored to the needs of the specific users show more potential than a one-size-fits-all-approach. We report on a qualitative study with 40 Dutch university students who used an online gamified system in the context of a master course for a period of 15 weeks. The preliminary findings disclose partial evidence that personalization should already be accounted for during the design phase of the system.

Author Keywords

Gamification; User; Context; Motivation; Education; Personalization

ACM Classification Keywords

H.5.m [Information Interfaces and Presentation (e.g., HCI)]: User Interfaces - User-Centered Design; K.3.1 [Computers and Education]: Computer Uses in

Education; K.8.0 [Personal Computing]: General – Games.

Introduction

Gamification is a design technique in which elements typically used in games (like badges or rankings) are used in contexts that aren't related to games (like education, health or sports) [12]. This technique originated from the idea that millions of hours are spent voluntarily playing (video) games. For example, a recent European study reported that some 50 % of people between ages 11 and 64 spend on average six to eight hours playing videogames each week [18]. This leads to the belief that games are inherently intrinsic motivating [6,13,28], which is the type of motivation caused by the activity itself because it is found to be personally rewarding [11,17,20,26,30], like when studying because of a genuine interest in the subject. Therefore gamification is believed to motivate humans in non-game related contexts [16]. Following this line of reasoning, gamification may be used in educational contexts to address the challenges connected with the observed decrease in educational motivation in different aged students (see e.g. [1,3,4,5,9,14,15,16,18]).

Some researchers have already investigated motivational effects of gamification in education, leading to inconclusive results (for a recent overview, see [15]). Taking into account the important role motivation occupies in education [1,2,5,8,16,29], we argue that for the research field to mature it is urgent to thoroughly investigate gamification's effect on motivation in an educational context, as is acknowledged by Richter, Raban and Rafaeli [25].

Motivation is a highly human specific construct. Previous research has already demonstrated that different design elements motivate people in different ways [22]. Therefore, we expect personalized gamification to yield better motivational effects than a one-size-fits-all gamified system. The usefulness of this personalization is already demonstrated in other domains like games and persuasive technologies (for example, see [3,19]). While the authors were investigating the motivational impact of a gamification system, some interesting findings originated which support this position. This paper will focus on these results and questions the potential of personalization of gamified systems in an educational context.

Method

A study with a procedure comparable to that of Hanus and Fox [16] was set up to test the motivational effects of gamification in education. More particularly, we gamified the educational support that was given as part of a master course taught in English at a large Flemish (the Dutch speaking part of Belgium) university.

Procedure

To assist the students in writing the assignments that were an obligatory evaluation component for the

course, a Google+ Community was set up so students could ask each other and the teaching staff (including the professor) questions, share interesting articles and insights and get feedback on their ideas and initial writings. This Google+ Community was gamified using challenges, personal badges and a group competition. Participation on this platform was not obligatory.

After using the community for fifteen weeks, students were invited to voluntarily participate in a focus group interview to give their final feedback during the last week of the semester. Participants were rewarded with pizza and a € 10 gift voucher of a large multimedia store chain in Belgium. Activity on the Google+ Community and participation in the focus groups did not have an impact on students' grades. Students were not informed about the researchers' specific interest in gamification, but were thoroughly debriefed at the end of the study.

During the focus group, participants were asked to give feedback about the Google+ platform. The moderator, a male researcher of 24 years old and first author of this paper, guided the conversation by starting to ask broad questions (e.g., what are your general feelings regarding the platform?) and narrowing the scope towards the end (e.g., do you think that the game elements influenced your use of the platform?). Before the start of the focus groups, participants had not met the moderator in a way other than via the platform or via mail, although he was known to be part of the teaching staff of the course. Focus groups lasted for about two hours.

The university's Social and Societal Ethics Committee approved this procedure.

Participants

40 students, of which 21 female, voluntarily enrolled in the master course and participated voluntarily in surveys assessing their motivation¹. Seven of them also participated in one of two focus group sessions. With five of them being 23 or 24 and four of them having Belgian origins, participants of the focus group were a good representation of the students enrolled in the course.

Analysis

The audio recordings of the focus groups were transcribed ad verbatim. The researchers performed a descriptive analysis on the data to search for explanations for the changes in motivation observed in the surveys. Therefore, transcriptions of the focus groups were first coded using an open coding procedure. Using these initial codes, a codebook was composed to link different codes to overarching themes. Due to space limitations and the preliminary nature of the results, we will limit the results to the discussion about the inclusion or exclusion of the teaching staff on the platform.

Preliminary results²

The preliminary results showed that personal characteristics of the users proved to be an important factor in how motivated students were to participate on the platform, and indicated the need to already adapt

or personalize system characteristics to the needs of the different users in the early design phases.

During the focus groups it became clear that some students liked the Google+ Communities used in class, but were hold back to fully participate because of feelings of uncertainty and insecurity. Especially the fact that both peers and teaching staff could read their contributions made them hesitant to actual participate:

“Sometimes I wished not everyone would be able to read [my contributions], because it could be a stupid question.” (Femke³, female, 24 years old)

“If students know that the professor who will assess you is reading [the contributions], you’re inclined to not ask a question if you are not sure. Because you don’t want to look as if you don’t know anything about the subject.” (Karen, female, 23 years old)

Apparently, the presence of the professor in combination with the oral exam that would follow at the end of the course strengthened this insecurity:

“As long as not only students are able to read [my contributions], I do want to do good, because the [teaching staff] will read those.” (Lynn, female, 23 years old)

¹ The results of these surveys will not be discussed in this paper.

² The reported results emerged from a preliminary analysis of the gathered data. At the time of the workshop, a more thorough analysis will be finished, which will lead to more insights.

³ Used names are pseudonyms.

"I think [somebody from the supporting teaching staff] is not that intimidating. It is just like, I don't know, you will not be evaluating me during the exam [...]. If the professor would be more present on the community, I would feel more [insecure]." (Laura, female, 23 years old)

Although some students would have preferred a safe online environment without teaching staff, or at least without the professor, watching over them, other students felt like that would lead them to stop participating:

"If I ask a question, I prefer to get the answer from [the teaching staff] or from the professor. [...] If the teaching staff would not be on the Google+ Community, I would not participate [...] or participate less." (John, male, 30 years old)

"I would contribute less [if the teaching staff would not be present on the community]. As a matter of fact I would like them to be more involved." (Hannah, female, 45 years old)

"If there are problems or if somebody is saying something ridiculous, the fact that [the teaching staff] is present [on the platform] is like, 'it will be okay'. Otherwise they would say something." (Laura, female, 23 years old)

These quotes prove that the mere inclusion or exclusion of the teaching staff on the platform in a one-size-fits-all-approach affects students' motivation to participate, either because of insecurity or because they want to be reviewed by the teaching staff. Therefore, it is important to be aware of these personal preferences of

the users starting from the early phases of the design process.

A more thorough analysis of the collected data is still needed. That way more insights about the need to personalize gamified systems might originate. For example, by comparing the evolution of individual students' motivational levels throughout the semester, personalized patterns of gamification effects might become clear. Furthermore, also the analysis of the participants' reactions towards the used gamification elements can lead to interesting insights in this domain.

Conclusion

This study investigated whether personalized gamification systems tailored to the needs of the specific users show more potential than a one-size-fits-all-approach. The preliminary findings show that a one-size-fits-all-approach has significant drawbacks when it comes to the decision to include or exclude the teaching staff from participating in the gamified system that is being used to give students support in an educational context. The results suggest that a one-size-fits-all approach demotivates a part of the students to participate. Therefore it is important to design a gamified system by using a user-centered design-process with special attention to personal differences in motivational cues. To assist industry in this process, more research should be conducted in the field of personalization and how to best develop and implement such personalized systems.

References

- [1] Abramovich, S., Schunn, C., and Higashi, R.M. Are badges useful in education?: it depends upon the type of badge and expertise of learner. *Educational Technology Research and Development* 61, 2 (2013), 217–232.
- [2] Alexe, I., Zaharescu, L., and Apostol, S. Gamification of Learning and Educational Games. *Conference Proceedings of "eLearning and Software Education" (eLSE)*, (2013), 67–72.
- [3] Bakkes, S., Tan, C.T., and Pisan, Y. Personalised Gaming: A Motivation and Overview of Literature. *Proceedings of The 8th Australasian Conference on Interactive Entertainment: Playing the System*, ACM (2012), 4:1–4:10.
- [4] Bouffard, T., Marcoux, M.-F., Vezeau, C., and Bordeleau, L. Changes in self-perceptions of competence and intrinsic motivation among elementary schoolchildren. *British Journal of Educational Psychology* 73, 2 (2003), 171–186.
- [5] Buckley, P. and Doyle, E. Gamification and Student Motivation. *Interactive Learning Environments* 22, 6 (2014), 1–14.
- [6] Burguillo, J.C. Using game theory and Competition-based Learning to stimulate student motivation and performance. *Computers & Education* 55, 2 (2010), 566–575.
- [7] Busse, V. and Walter, C. Foreign Language Learning Motivation in Higher Education: A Longitudinal Study of Motivational Changes and Their Causes. *Modern Language Journal* 97, 2 (2013), 435–456.
- [8] Cheong, C., Cheong, F., and Filippou, J. Quick Quiz: A Gamified Approach for Enhancing Learning. *PACIS 2013 Proceedings*, (2013).
- [9] Corpus, J.H., McClintic-Gilbert, M.S., and Hayenga, A.O. Within-Year Changes in Children's Intrinsic and Extrinsic Motivational Orientations: Contextual Predictors and Academic Outcomes. *Contemporary Educational Psychology* 34, 2 (2009), 154–166.
- [10] Darby, A., Longmire-Avital, B., Chenault, J., and Haglund, M. Students' Motivation in Academic Service-Learning Over the Course of the Semester. *College Student Journal* 47, 1 (2013), 185–191.
- [11] Deci, E.L. and Ryan, R.M. *Handbook of Self-determination Research*. University Rochester Press, Rochester, NY, 2004.
- [12] Deterding, S., Dixon, D., Khaled, R., and Nacke, L. From Game Design Elements to Gamefulness: Defining "Gamification." *Proceedings of the 15th International Academic MindTrek Conference: Envisioning Future Media Environments*, ACM (2011), 9–15.
- [13] Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernández-Sanz, L., Pagés, C., and Martínez-Herráiz, J.-J. Gamifying learning experiences: Practical implications and outcomes. *Computers & Education* 63, (2013), 380–392.
- [14] Gottfried, A.E., Fleming, J.S., and Gottfried, A.W. Continuity of academic intrinsic motivation from childhood through late adolescence: A longitudinal study. *Journal of Educational Psychology* 93, 1 (2001), 3–13.
- [15] Hamari, J., Koivisto, J., and Sarsa, H. Does Gamification Work? – A Literature Review of Empirical Studies on Gamification. *Proceedings of the 47th Hawaii International Conference on System Sciences*, (2014), 3025–3034.
- [16] Hanus, M.D. and Fox, J. Assessing the effects of gamification in the classroom: A longitudinal study on intrinsic motivation, social comparison, satisfaction, effort, and academic performance. *Computers & Education* 80, (2015), 152–161.
- [17] Harlen, W. and Crick, R.D. Testing and Motivation for Learning. *Assessment in Education: Principles, Policy & Practice* 10, 2 (2003), 169–207.

- [18] Interactive Software Federation of Europe. GameTrack Quarterly Digests - Third Quarter of 2014. 2014. <http://www.isfe.eu/industry-facts/statistics>.
- [19] Kaptein, M., Markopoulos, P., de Ruyter, B., and Aarts, E. Personalizing persuasive technologies: Explicit and implicit personalization using persuasion profiles. *International Journal of Human-Computer Studies* 77, (2015), 38–51.
- [20] Knaving, K., Woźniak, P., Fjeld, M., and Björk, S. Flow is Not Enough: Understanding the Needs of Advanced Amateur Runners to Design Motivation Technology. *Proceedings of the 33rd Annual ACM Conference on Human Factors in Computing Systems*, ACM (2015), 2013–2022.
- [21] Lepper, M.R., Corpus, J.H., and Iyengar, S.S. Intrinsic and Extrinsic Motivational Orientations in the Classroom: Age Differences and Academic Correlates. *Journal of Educational Psychology* 97, 2 (2005), 184–196.
- [22] Orji, R., Mandryk, R.L., Vassileva, J., and Gerling, K.M. Tailoring Persuasive Health Games to Gamer Type. *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems*, ACM (2013), 2467–2476.
- [23] Otis, N., Grouzet, F.M.E., and Pelletier, L.G. Latent Motivational Change in an Academic Setting: A 3-Year Longitudinal Study. *Journal of Educational Psychology* 97, 2 (2005), 170–183.
- [24] Pan, Y. and Gauvain, M. The continuity of college students' autonomous learning motivation and its predictors: A three-year longitudinal study. *Learning and Individual Differences* 22, 1 (2012), 92–99.
- [25] Richter, G., Raban, D.R., and Rafaeli, S. Studying Gamification: The Effect of Rewards and Incentives on Motivation. In T. Reiners and L.C. Wood, eds., *Gamification in Education and Business*. Springer International Publishing, 2015, 21–46.
- [26] Ryan, R.M. and Deci, E.L. Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist* 55, 1 (2000), 68–78.
- [27] Spinath, B. and Spinath, F.M. Longitudinal Analysis of the Link between Learning Motivation and Competence Beliefs among Elementary School Children. *Learning and Instruction* 15, 2 (2005), 87–102.
- [28] Su, C.-H. and Cheng, C.-H. A mobile gamification learning system for improving the learning motivation and achievements. *Journal of Computer Assisted Learning* 31, 3 (2015), 268–286.
- [29] Taylor, G., Jungert, T., Mageau, G.A., et al. A self-determination theory approach to predicting school achievement over time: the unique role of intrinsic motivation. *Contemporary Educational Psychology* 39, 4 (2014), 342–358.
- [30] Vansteenkiste, M., Lens, W., and Deci, E.L. Intrinsic Versus Extrinsic Goal Contents in Self-Determination Theory: Another Look at the Quality of Academic Motivation. *Educational Psychologist* 41, 1 (2006), 19–31.

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