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GAMIFICATION IS ALL ABOUT FUN: THE ROLE OF INCENTIVE TYPE AND COMMUNITY COLLABORATION

Complete Research

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Abstract

As the transformation of various services into appealing game-like experiences is in its infancy, limited research exists in the area and in particular on the way each gamification design decision affects intended outcome. In the present study we investigate the impact of two game elements (incentive type and community collaboration) on user's experienced fun during participation in a gamified service. Via an experiment (N=108), we examine the role of Incentive Type [Accomplish an achievement versus Receive discounted offer], as a motivator for participation, and Community Collaboration, as participation setting (individual pursuit of goals versus collaborative pursuit of goals), on experienced fun in the context of a gamified consumer service. The service is aimed at assisting consumers in their efforts to adopt an ecologically conscious consumer behaviour. Results indicate that the selection of community collaboration as a form of interaction presents significant difference in experienced fun during participation, whereas accomplishing an achievement opposed to receiving discounted price does not.

Keywords: Gamification, Gamified service, Incentive types, Community collaboration.

1 Introduction

The gamification of services, education, sales and various other interactions with users and consumers has become a trend lately. Gamification refers to the “use of game elements and techniques in non-game contexts (Deterding et al. 2011b p.2) to motivate engagement, participation and even drive behaviour towards predefined objectives. In extension, to gamify a process or an activity refers to the reengineering and transformation of the process or activity in a game-like experience for the participants. In essence, it is a process that requires the initial decomposition of games into building blocks (Hunicke et al. 2004, p. 2) and the subsequent introduction of selected blocks to the activity or process with the ultimate goal to enhance appeal and motivate users to engage with it, by making participation enjoyable and fun (Chronis and Sundell 2011). Gamification elicits a plethora of game elements and techniques like points, badges, leaderboards, rewards, levels, quests, challenges and virtual loops amongst others (De Paoli et al. 2012; Dominguez et al. 2013; Zichermann 2011) to assist in the process of the transformation of the selected context into a gamified experience, by incorporating the game elements, towards making participation fun and enjoyable.

In the last few years, an explosion of gamified technology-based services has occurred in contexts pertaining to marketing, education, employee productivity and health amongst others with target goal to motivate users to engage (Kankanhalli 2012; Koutropoulos 2012), learn (Simões 2012), shop (Harwood 2012) and even lead a healthier life (Xu 2012). In a multitude of potential fields of application for gamification, the introduced game elements and resulting gamified services are expected to drive behaviour and enhance engagement. However, each implementation requires that gamification designers take into account the non-game context's specific attributes towards successfully implementing game-like experiences. In case the design fails to meet the services' strategic goals, there is an underlying danger that gamification will fail. In a report on gamification, Gartner Inc. (2012) estimates that "about 80 percent of current gamified applications will fail to meet business objectives primarily due to poor design". It is thus crucial to understand and evaluate the role each gamification element plays during the design phase of a gamified service, building on prior research efforts in respect to the design of technology-based services (Davis et al. 1989; Theotokis et al. 2008; Venkatesh et al. 2003).

Although implementations of gamification in practice present interesting results, there is limited research that addresses the impact of different game elements and techniques on user participation experience, engagement and enjoyment. These outcomes have often been used in order to guide design decisions and support the evaluation of electronic services (Bobbitt and Dabholkar 2001; Simon and Usunier 2007; Venkatesh et al. 2003), but have not been related to the use of gamification elements in service design. This has been the motivation behind the present research and the gap this research attempts to fill. Specifically, we focus on the impact of incentive types and community collaboration on consumer's experienced fun during participation in the context of a gamified service. This was studied using a laboratory experiment, in which participants experienced four scenarios that employed (and differ from one another in respect to) the introduced game elements. Our dataset consists of the answers collected by 108 participants pertaining to their perceived experienced fun during participation.

To the best of our knowledge, none of the extant studies examine the impact of incentive types and community collaboration on experienced fun during participation in a gamified service. The main contribution of this research derives from the empirical evaluation of selected game elements in relation to potential impact. As enterprises continuously jump on the gamification wagon to gain potential benefits, our findings can potentially assist in the selection and justification of the aforementioned specific game elements and their eligibility for introduction in their upcoming gamified offering.

The rest of the paper proceeds as follows: in background of gamification, we present a review of gamification elements and motivation for user participation and enjoyment in a gamified service. Then we present the hypotheses and research methodology. Following, is a detailed description of the lab experiment and data analysis. We conclude with the discussion of the findings and the theoretical and practical implications of the present research as well as the limitations and future research directions.

2 Background on Gamification and Research Model

Gamification as a current trend is currently being endorsed by various enterprises as panacea to engage consumers in various activities. The trend of transforming consumer activities into game-like experiences is on the way to becoming a new paradigm for enhancing engagement, brand awareness and potentially loyalty through supporting a behavioural shift towards a desired objective. However, academic literature supporting this rapid evolution is scarce. Efforts towards a definition of the Gamification term have been made and different research streams embrace varying definitions. From the market service perspective, focusing on the overall goals, Huotari & Hamari (2012, p.19) define

gamification as “a process of enhancing a service with affordances for gameful experiences in order to support a user’s overall value creation”. From the educational perspective Lee and Hammer (2011, p.1) define Gamification as the “use of game mechanics, dynamics and frameworks to promote desired behaviours”. To date the most inclusive definition derives from Deterding et al. (2011b, p.2) who define Gamification as “.. the use of design elements characteristics for games in a non-game context”.

Introduction of gamification in practice is preceded by the need for decomposition of games into their respective elements and understanding of the effects they elicit. The game design literature provides us with frameworks to support the process (Bjork and Holopainen 2005; Elverdam and Aarseth 2007; Salen and Zimmerman 2004; Saltzman 2000). A widely adopted framework is the Mechanics, Dynamics, Aesthetics (MDA) Framework (Hunike et al. 2004). The MDA framework, stands for Mechanics, Dynamics, Aesthetics Framework and is a game design Framework that consists of three levels of abstraction that support the creation of a game in iterative stages based on the available game components and the potential interaction of player to the components and subsequent result from the player side, in contrast to the expected result from the producer side. In the MDA Framework, as defined by Hunike et al. (2004, p.2), Mechanics are “the particular components of the game, at the level of data representation and algorithms”, Dynamics constitutes “the run-time behaviour of the mechanics acting on player inputs and each others’ outputs over time” and Aesthetics is the “desirable emotional responses evoked in the player, when she interacts with the game system”. Following the Gamification paradigm and using the MDA framework as a conceptual starting point, we are able to decompose games into their mechanics, dynamics and aesthetics in order to extract game elements from a variety of games and associate them with the desired behaviour change target towards creating a gamified service that has specific motivators for participation. The MDA Framework is suitable for gamification of contexts as it elicits three different levels of abstraction in the game design process and creates a roadmap to examine the relationship between game elements eligible for introduction (stemming from Mechanics), rules of interaction in the particular context (stemming from Dynamics) and reason for introduction based on expected evocation of emotional responses (stemming from Aesthetics).

In the MDA Framework the Aesthetics level elaborates on player’s potentially evoked emotional responses through a specific taxonomy that includes “Sensation, Fantasy, Narrative, Challenge, Fellowship, Discovery, Expression and Submission” (Hunicke et al. 2004, p.2) differentiating from terms as “Fun”. However, as Gamification is still under development, it is prudent to retract to basic emotional responses as Fun prior to examining and addressing specific emotional responses. Fun as an aesthetic property of games, as experienced by players, is evident in the very existence of the term “game” stemming from the “Indo-European root 'ghem' which means 'playing for fun’” (Choi et al. 1999). Malone (1980) in particular pioneered in examining fun in computer games and proposed a taxonomy for what makes a computer game fun to participate (Malone and Lepper 1987) that contains four heuristics for design (Challenge, Fantasy, Curiosity and Control). Extending the theories of fun, there are various studies in the gaming literature (Garneau 2001), marketing literature (Dabholkar and Bagozzi 2002; McGonigal 2011) and psychology literature (McManus and Furnham 2010) that elaborate on possibilities for experiencing fun during participation in a game or non-game contexts.

In a gamification setting the mechanics available include: Points used to track interaction with the service and report to the system and the player the effect of their choices (Cheong et al. 2013; Eickhoff et al. 2012; Farzan et al 2008; Thom et al. 2012), badges as visual representations of accomplishments (Li 2012), skills or reputation (De Paoli et al. 2012), leaderboards as means of player-to-player performance comparison (Butler 2013; Kosmadoudi 2013; Thom et al.2012), levels to display progression (Sampanes 2013), challenges to drive players to perform pre-defined tasks (Zichermann 2011) and incentive mechanisms (as rewards) to support and encourage the player in the game.

Lastly, in the Dynamics level under a gamification setting, the interaction of the users with the game mechanics is utilised to link between the potential range of behaviours the service aims to support and

the user's progression within them towards the accomplishment of their predefined set of in-game goals, while accomplishing the Aesthetics gamification design goals.

In an abundance of game elements and taking under consideration that an important target goal of gamification is to motivate individuals in becoming engaged with a task and potentially changing their behaviour (Burke 2011) by having fun amongst others (McGonigal 2011), we need to examine the motives behind user's participation in a gamified setting and the effect that specific gamification design choices have on them.

To that end, we can utilize motivation theories that attempt to explain drivers of individuals' behaviour. Motivation theorists Ryan and Deci (2000) identified two main types of motivation: intrinsic and extrinsic. Intrinsic motivation occurs when individuals are driven to perform an activity due to satisfaction from the activity itself, where extrinsic motivation occurs when individuals are driven to perform an activity due to the prospect of attaining an external or separable outcome. In particular, when examining the incentive type game elements under the Goal Contents Theory (GCT) (Vansteenkiste et al. 2006) of Self Determination Theory (SDT), monetary oriented goals in a gamification setting can be classified as extrinsic goals leading to extrinsic motivation, whereas achievement to learn or succeed can be classified as intrinsic goals leading to intrinsic motivation. Although the aforementioned are more complementary than mutually exclusive, previous research indicates that extrinsic reward motivation can undermine intrinsic motivation, as when individuals perform an activity for an external reward they start to see the cause in that behaviour to that reward opposed to their interest or enjoyment (DeCharms 1968), with negative consequences at least to the satisfaction deriving from the activity (Geen et al. 1984). Based on the aforementioned literature, as gamification is proposed as means to transfer the benefits of games to non-game contexts and their participants, it is evident that a subsequent aim of gamification is to increase the intrinsic motivation to participate. The current study examines the gamification benefit of experiencing fun and therefore, we propose:

Hypothesis 1: In a gamified context, the participant's experienced fun will be higher if he/ she is motivated to participate in an intrinsic rather than in an extrinsic goal setting, as defined by the game elements introduced.

Another important aspect deriving from the online game literature is the element of community collaboration towards a common goal. This originates in research on Massively Multiplayer Online Games (MMOGs) (Kong et al. 2012). In the MMOG game genre, players are encouraged to collaborate with other players by creating teams, groups and guilds towards the completion of a common activity and the achievement of a common goal. The aforementioned player collaboration and the exhibited social factor is one of the "main reasons behind the attraction to MMORPGs" (Ducheneaut et. al 2006 p.7). Extending on the benefits of collaboration as exhibited in the MMOG genre, "MMOG players are motivated to learn to perform well individually in order to achieve a collaborative victory" (Kong et al. 2012 p.7). The collaborative and social nature and its exhibited players' benefits in the online games literature is also consistent with the research of Ryan et al. (2006) proposing that whilst playing, individuals should experience, amongst others, relatedness referring to a sense of connection to other people via the game itself. That connection as experienced by the individual's contribution to a collaborative effort towards a goal can be seminal to the impact of a gamified service on individual's engagement with the service and experienced fun during participation. Therefore we propose:

Hypothesis 2: In a gamified context, the participant's experienced fun will be positively affected if he/she is able to collaborate with other participants towards a common goal.

3 Research Method

The research context of the study and the non-game context selected for examining the above hypotheses is the consumer shopping process in the fast moving consumer goods sector. The process goal was to drive the consumer in a more ecologically conscious behaviour at the point of selection and purchase. The gamification goal was to enhance the process by making it fun to participate in via the introduction of game elements. The rationale behind the context selection was that although the environmental conscious consumer is found to consider environmental factors during purchase, these are not the sole or most important ones in affecting the final choice (Faiers et al. 2007; Gadenne et al. 2011; Gaspar and Antunes 2011).

This context thus presents an interesting and appropriate test-bed where intrinsically oriented motives, as altruism and desire to protect the environment towards common good, collide with extrinsically oriented monetary incentives.

In order to examine potential benefits of introducing intrinsic and extrinsic goal settings, as defined by respective game elements, as well as community collaboration towards the aforementioned goals, a two (Incentive type) by two (Community collaboration) experimental design was used on a gamified service assisting the user, through a mobile application, in a laboratory experiment. The gamified service consisted of four fully functional mobile application demos, varying only in the selected motivators and possibility for community collaboration, as presented in the following paragraph. The narrative supporting the gamified service placed the consumer at the point of product selection in front of the shelf of a supermarket whilst he/she was considering the purchase of an environmentally-friendly product. At that point the participant was able to virtually interrogate the exhibited products and was subsequently presented with environmental information associated with the specific product. Additionally, (s)he was informed of the benefits one would receive upon selection of the environmental friendly product, as defined by the four versions of the gamified service.

The first version of the gamified service enabled the consumer (upon selection of the environmental friendly product) to receive points towards the individual recognition of helping the environment and achievement of becoming a “Green consumer”. The particular game element of the achievement goal was visually represented with an achievement badge and the consumer was unable to share the badge in any online community. The second version of the gamified service enabled the consumer to receive points in order to collaborate with a community of consumers towards a collaborative recognition of the community’s effort to help the environment and achievement of becoming a “Green community”. The emphasis was given on that the personal activity and choices would contribute to the collaborative goal. The achievement was visually represented with the game element of a badge awarded to the community. The third version enabled the consumer to receive points towards individual discount on future purchases of environmentally friendly products. In this scenario the consumer was unable to share his/ her eligibility for discount in any online community. Lastly, the fourth version enabled the consumer to receive points and allocate the points to the community pool of points, towards community discounts on future purchases of environmentally friendly products. As with the second version, the emphasis was given on the individual’s contribution to the community goal. All four versions established that the introduced game elements (constituting the mechanics level of the MDA Framework) would be functional to the degree that enabled the participants to choose whichever (from all available options) of navigation within the service (constituting the dynamics level of the MDA Framework) and fully experience the gamification service towards the identification of potential for participants to experience fun during participation (constituting the Aesthetics level of the MDA). The design of the lab experiment is presented in Table 1 and the respective four mobile app visuals (Experimental Stimuli) are illustrated in Figure 1.

		Community Collaboration Setting	
Incentive Type	Individual participation and Achievement of helping the environment (Figure 1a)	Collaboration with community and Achievement of helping the environment (Figure 1b)	
	Individual participation and Discounted Price (Figure 1c)	Collaboration with community and Discounted Price (Figure 1d)	

Table 1. Experimental Design

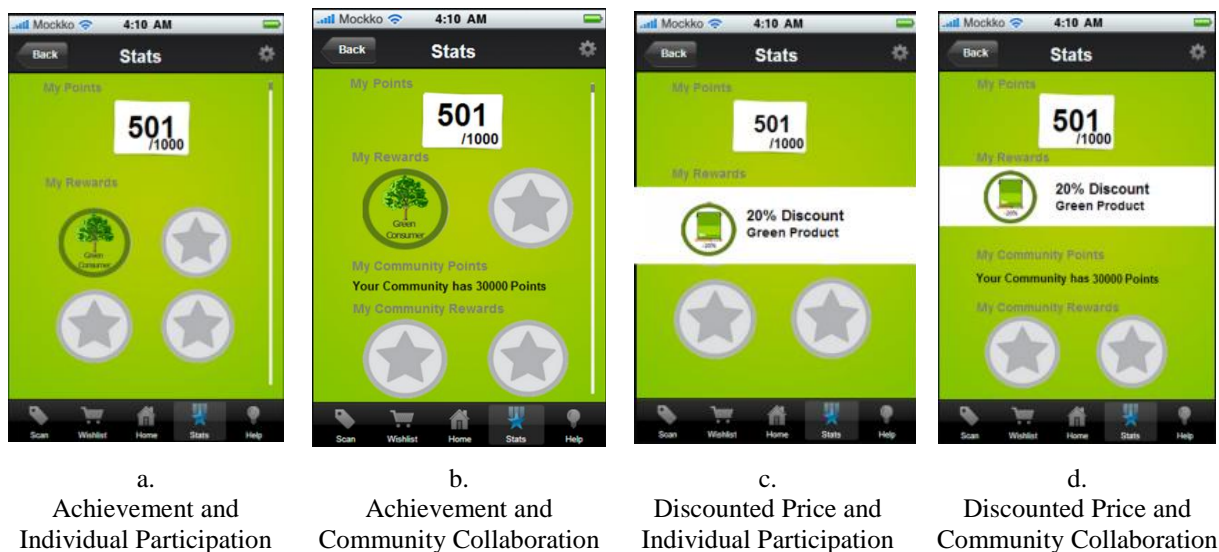


Figure 1. Experimental Stimuli of the gamified service

4 Participants - Measures

The participants (N=118) of the lab experiment were recruited from an undergraduate core interdisciplinary module class at a Greek public university under voluntary participation in one of three consecutive sessions. Participants' ages ranged from 18 to 35 years old, with a mean of 21.8 years old. Forty eight per cent of the sample was female. Among the 118 participants, 10 encountered technical difficulty during the lab experiment. Data of the remaining 108 participants were included in the analysis.

Upon arrival at the lab, participants completed a brief online questionnaire to gauge their demographics (Sex, Age, and Education Degree) and environmental attitudes and behaviour to control for context specific factors (degree of ecological behaviours) by adapting the Ecologically Conscious Consumer Behaviour instrument (Straughan and Roberts 1999). Following the completion of the questionnaire, participants were randomly assigned a version of the gamified service and each participant was invited to interact with a mock-up of the mobile app until he/she felt that they had become confident with it. All four versions of the app were fully functional mock-ups and the participants had the ability to interact with the assigned version to the extent he/she wanted as there was no predefined time constraint on the use of the app.

After each participant experienced the gamified service via the functional mock-up of the app, they were invited to take a post-test questionnaire. The questionnaire gauged perceived experienced “Fun” while experiencing the gamified service, measured by adopting a scale from Dabholkar’s attitudinal framework (Dabholkar and Bagozzi 2002). Participants rated on 7-point Likert-type scales, anchored by 1=“Strongly Disagree” and 7=“Strongly Agree”, the following statements: “The gamified service will not be interesting (reverse scored)”, “The gamified service will be entertaining”, “The gamified service will not be fun (reverse scored)” and “The gamified service will be enjoyable”. Additionally two questions were created to ensure that participants had a clear understanding of the introduced game elements and their effect within the gamified app as follows: “Within the service you were able to share your points with a community” and “Within the service you were able to receive discounted price upon future purchase of products”. The instruments used for data collection were tested prior to the lab experiment in a pilot with a small number of participants that suggested adequate reliability and validity.

5 Results

In order to assess internal consistency of the measurement instruments Internal Composite Reliability (ICR) was used. The acceptable values of an ICR should exceed 0.70 (Ferketich 1991; Nunnally and Bernstein 1994) and can be interpreted as the Cronbach Alpha Coefficient (Chronbach 1951). Both the experienced fun measurement instrument (4 items; $\alpha = 0.836$) as well as the ecologically conscious behaviour instrument (8 items; $\alpha = 0.830$) were found to be highly reliable. Additionally, the manipulation check showed that participants correctly perceived the four different treatments.

Two-way between subjects analysis of variance (ANOVA) was conducted to test the hypotheses using SPSS 17.0 for Windows at a 95% confidence level. The descriptive statistics are summarised in Table 2, and the results from the Levene’s test for homogeneity illustrate a significance level of 0.032 (< 0.05).

Community Collaboration	Goal Setting	Mean	S.D	N
Community Collaboration Available	Achievement	4.67	.86	30
	Price Reduction	4.62	1.04	27
	Total	4.64	.94	57
Community Collaboration Non-Available	Achievement	3.67	1.49	27
	Price Reduction	3.95	1.42	24
	Total	3.80	1.45	51
Total	Achievement	4.19	1.29	57
	Price Reduction	4.30	1.26	51
	Total	4.25	1.27	108

Table 2. Descriptive Statistics for perceived fun during participation in a gamified service

The results of the two-way ANOVA on the dependent variable (Fun) (Table 3) show that there is significant difference among subjects that experienced different setups of community collaboration ($F = 12.58$, $p = 0.001$) on perceived fun during participation in the gamified service. The present finding supports Hypothesis 2 (Table 4). However, there was no significant difference between groups with different incentive types on perceived fun during participation at the significance level of 0.05. Hypothesis 1 is thereby not supported (Table 4). The ANOVA test found no interaction effects

between Community collaboration and Incentive type, indicating that these variables do not jointly affect perceived fun during participation in a gamified service. In addition, two-way ANOVA tests on the ECCB control variable showed that there was no significant difference between the four groups in respect to the environmentally conscious consumer behaviour that could have potentially affected the results ($F = 1.533$, $p = .221$). Lastly, in terms of the demographic control variables (Age, Sex and Education Degree) for the treatment groups, no significant difference between the four treatments was found.

Source	Type III sum of squares	d.f.	Mean square	F	Significance
Corrected Model	20,153 ^a	3	6.71	4.53	.005
Intercept	1921.650	1	1921.65	1297.01	.000
Community Collaboration	18.639	1	18.63	12.58	.001
Goal setting (Incentive type)	.359	1	.35	.24	.624
Community Collaboration * Goal Setting	.722	1	.72	.48	.487
Error	154.086	104	1.48		
Total	2126.167	108			
Corrected Total	174.239	107			

(*) Signifies the interaction effect between Community Collaboration and Goal Setting. The ANOVA test was conducted at the significance level of .05
^a $R^2 = .166$ (adjusted $R^2 = .090$)
^b Computed using alpha = .05

Table 3 ANOVA tests of between-subjects effects on variances on perceived experienced fun during participation in a gamified service

Hypothesis	Significance	Evaluation
Hypothesis 1: In a gamified context, the participant's experienced fun will be higher if he/ she is motivated to participate in an intrinsic rather than in an extrinsic goal setting, as defined by the game elements introduced.	0.624	Not Supported
Hypothesis 2: In a gamified context, the participant's experienced fun will be positively affected if he/she is able to collaborate with other participants towards a common goal.	0.001	Supported ^a

^a Supported at the 0.05 level

Table 4. Summary of Hypothesis testing

6 Discussion of the findings

Gamification is an innovative practice that creates an enhanced type of services that aim to create game – like experiences for the participants, in order to drive behaviour. The gamification of a service is accomplished via the introduction of game-elements like points, badges, leaderboards, rewards etc..

In an abundance of game-elements available in gamification, it is essential to identify the effect each one can exhibit and the degree to which it assists in the service objectives. As little evidence is extant on how each introduced game element influences perceptions of fun from the participants' perspective, we conducted a laboratory experiment with a gamified service to examine two specific game – elements: community collaboration and incentive type.

An important finding of the present research, as results indicate, is that in a gamified service the ability of participants to collaborate with other participants in a community setting towards the pursuit of common goals presents statistically significant difference in the experienced fun, in comparison to individual pursue of goals due to the lack of community. The element of community collaboration towards the pursuit of common goals can be found in online games and the Massively Multiplayer Online Games genre in particular where players are enabled to collaborate with other players by creating teams, groups and guilds towards the completion of a common activity and the achievement of a common goal (Ducheneaut 2006; Kong et al. 2012; Yee 2006). This is consistent with the research of Ryan et al. (2006) proposing that whilst playing, individuals should experience, amongst others, relatedness referring to a sense of connection to other people via the game itself. That connection, as experienced by the individual's contribution to a collaborative effort towards a goal, can be seminal to the impact of a gamified service on individual's experienced fun during participation. In online games, community collaboration is an established setting for player participation and results indicate the potential for transferability of the specific design game element to the gamification of services.

An additional finding that presents potential, especially to practitioners of gamification in the industry, derives from the rejection of Hypothesis 1. The gamification service employed strongly contradictory (in terms of intrinsic and extrinsic orientation) goals, that of Achieving to help the environment or Receiving discounted prices respectively. Results on the introduced contradictory incentives illustrate that participants' experienced fun was not statistically significantly different in the case of community collaboration setting. In the absence of the community collaboration, it appears that the type of the introduced incentives plays some role. This can be due to the inherent differences of participating for yourself, by yourself in contrast to participating both for yourself as well as part of a community and reaching after goals that adhere to the community as a whole. However, this finding may be related to the specific application context and further research is required to confirm applicability in other gamified services.

The present study extends the gamification literature by empirically assessing the role of incentive type and collaborative pursue of community goals on experienced fun during participation in the gamification of a non-game context. Previous research identified the need for such differentiation (Kankanhalli et al. 2012; Lounis et al. 2013) and empirical examination of game elements in a gamification setting and the present study is a step towards this direction. Pertaining to the incentive type game element the present research identified that the selection of two different and opposing (based on motivation) incentive oriented game elements (intrinsically oriented versus extrinsically oriented) did not present significant difference in the experienced fun during participation. In respect to the introduction of collaboration in a gamification setting, results indicate that individuals experience fun significantly higher when they collaborate with others towards a common goal than when they do so alone, which is consistent with findings from previous research in game literature and in particular research on MMOG and MMORPG (Kong 2012; Nardi and Harris 2006). One of the main motivators for participation in games is having fun and that state appears to be transferable to the gamification literature.

In respect to the practical implications of the research findings, first a useful guideline for the two examined game elements is formed that can assist designers evaluate and support their decision on potential gamification offerings. In the absence of community collaboration the incentive mechanism plays a role in regards to which type (intrinsic or extrinsic) is employed and the operationalization of

the type. However, in the presence of collaboration in a gamified setting, the incentive mechanism seems to take a second part as far as experienced fun is concerned and monetary incentives do not present different results when compared to achievements. This can be seen as a possibility for cost reduction from the business employing gamification. Lastly, results support that in a gamification setting collaboration towards goals is significantly more enjoyable than individual pursuit, setting a clear direction to the introduction of collaborative quests and collaborative challenges.

7 Limitations and future research directions

The present research is a first attempt to explain the role of different gamification elements on participant enjoyment and has various limitations. The first limitation is that only two of the available game mechanics were examined in parallel and in relation to experienced fun. A future research direction is the introduction and examination of different game mechanics under varying non-game contexts and gamification implementations, as well as in relation to the attitude and intention of participant engagement. Another limitation and direction for future work is the identification and exploration of the underlying goal setting motivation and perceived level of collaborative potential during participation in a gamified service. This requires a deeper understanding of pre-existing participants' attitudes and progress towards optimal gamification settings. A third limitation is due to the utilisation of a controlled laboratory experiment and the accompanying flaws in terms of realism. However, as the purpose of the present research was to examine a specific gamification setting for perceived fun, precision was essential for validation. As such, a laboratory experiment was the most appropriate method. Future research will replicate the experimental design in a field study. Finally, a fourth limitation is external validity because a convenience sampling of university undergraduate students was used. Thus, generalizability may be limited to a certain degree. Future studies could expand this research to other user segments.

8 Conclusions

In a scenery of ever changing interests and fleeting attention, the trend of gamification gradually gains ground towards becoming a sustainable technique for enhancing engagement, besides the exhibited skepticism. At present time, practitioners of gamification report successful cases, suggesting that the introduction of game elements in non-game contexts is beneficial. However, as the scenery evolves, the currently exhibited benefits may diminish. To that end, future gamification efforts must deviate from the current mantra of "employ all game elements you can image" towards informed decisions of including game elements in a gamified setting. The findings reported in the present study and the main contribution to the limited body of gamification research, positions the game elements of goal settings as incentive mechanisms and community collaboration in the gamification design in relation to the potential impact on experienced fun during participation, thus taking a step towards engagement with a gamified service. All things considered, in the end gamification requires having fun.

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References

- Bjork, S. (2004). *Patterns in Game Design*, Hinham, MA: Charles River Media.
- Bobbitt, L.M. and Dabholkar, P.A. (2001). Integrating attitudinal theories to understand and predict use of technology-based self-service. *International Journal of Service Industry Management*, 12 (5), pp. 423-450.
- Burke B. (2011). *Maverick Research: Motivation, Momentum and Meaning: How Gamification can Inspire Engagement*, Gartner Inc. (October)
- Butler, C. (2013). The Effect of Leaderboard Ranking on Players' Perception of Gaming Fun. In Ozok A.A. and Zaphiris P.(Eds.): *OCSC/HCI 2013*, LNCS 8029 pp 129-136
- Cheong, C., Cheong, F., Filippou, J. (2013). Quick Quiz: A Gamified Approach for Enhancing Learning. In *Proceedings of the 17th Pacific Asia Conference on Information Systems (PACIS 2013)*, Jeju Island, Korea. Paper 206
- Choi, D., Kim, H., Kim, J. (1999). Toward the construction of fun computer games: Differences in the views of developers and players. *Personal Technologies*, 3 (3), pp. 92-104
- Cronbach, L. J. (1951). Coefficient alpha and the internal structure of tests, *Psychometrika* (16), pp. 297-334.
- Chrons, O. and Sundell, S. (2011). *Digitalkoot: Making Old Archives Accessible Using Crowdsourcing*. In *Proceedings of the 3rd Human Computation Workshop (HCOMP 2011)*, San Francisco, California.
- Dabholkar, P. A. and Bagozzi, R.R. (2002). An Attitudinal Model of Technology –Based Self Service: Moderating Effects of Consumer Traits and Situational Factors. *Journal of the Academy of Marketing Science*, 30 (3), pp. 184-201.
- Davis F.D., Bagozzi, R.P. and Warshaw, P.R. (1989). User Acceptance of Computer Technology: a comparison of two theoretical models. *Management Science*, 35(8), pp. 982-1003
- De Paoli, S., De Uffici, N., D'Andrea, V. (2012). Designing Badges for a Civic Media Platform: Reputation and Named Levels. In *Proceedings of the 26th Human Computer Interaction (HCI 2012) Conference*, Birmingham, UK.
- DeCharms, R. (1968). *Personal Causation: The internal effective determinants of behavior*, New York: Academy Press.
- Deterding, S., Dixon, D., Khaled, R., Nacke, L. (2011a). From Games Design Elements to Gamefulness: Defining “Gamification”. In *Proceedings of The 15th International Academic Mindtrek Conference*, Finland, Tampere.
- Deterding, S., Khaled, R., Nacke, L.E., Dixon, D. (2011b). Gamification: Towards a Definition. In *Proceedings of the ACM CHI Conference on Human Factors in Computing Systems (CHI 2011) Gamification Workshop*, Vancouver, BC, Canada.
- Domínguez, A., Saenz-de-Navarrete, J., de-Marcos, L., Fernández-Sanz, L., Pagés, C., Martínez-Herráiz, J.J. (2013). Gamifying learning experiences: Practical implications and outcomes. *Computers & Education* (63), pp. 380-392.
- Ducheneaut, N., Yee, N., Nickell, E., Moore, R.J. (2006). ”Alone Together?”: Exploring the social dynamics of massively multiplayer online games. In *Proceedings of CHI 2006 SIGCHI Conference on Human Factors in Computing Systems*, New York, USA, pp. 407-401.

- Dunlap, R. E., & Van Liere, K. D. (2008). The "New Environmental Paradigm". *The journal of environmental education*, 40(1), 19-28.
- Eickhoff, C., Harris, C.G., de Vries, A.P., Srinivasan, P. (2012). Quality through Flow and Immersion: Gamifying Crowdsourced Relevance Assessments. In *Proceedings of SIGIR 2012*, August 12-16, Portland, Oregon, USA, pp 871-880
- Elverdam C. and Aarseth, E., (2007). Game Classification and Game Design: Construction Through Critical Analysis. *Games and Culture*, 2 (1), pp. 3-22
- Faiers, A., Cook, M., Neame, C. (2007). Towards a contemporary approach for understanding consumer behaviour in the context of domestic energy use. *Energy Policy*, 35, pp. 4381-4390.
- Farzan, R., DiMicco, J.M., Millen, D.R., Dugan, C., Geyer, W., Brownholtz, E.A. (2008). Results from deploying a participation incentive mechanism within the enterprise. In *Proceedings of the twenty-sixth annual SIGCHI conference on Human factors in computing systems*, pp. 563-572
- Ferketich, S. (1991). Focus on psychometrics: Aspects of item analysis. *Research in Nursing & Health* 14, pp. 165-168.
- Gadenne, D., Sharma, B., Kerr, D., Smith, T. (2011). The influence of consumers' environmental beliefs and attitudes on energy saving behaviour. *Energy Policy*, 39, pp. 7684-7694.
- Garneau, P.A. (2001). Fourteen Forms of Fun. *Gamasutra*, 12 October, http://www.gamasutra.com/features/20011012/garneau_01.htm
- Gartner Inc. (2011). Gartner Predicts Over 70 Percent of Global 2000 Organizations Will Have at Least One Gamified Application by 2013. 09/11, <http://www.gartner.com/newsroom/id/1844115>
- Gartner Inc. (2012). Gartner Says by 2014, 80 Percent of Current Gamified Applications Will Fail to Meet Business Objectives Primarily Due to Poor Design. 27/11, <http://www.gartner.com/newsroom/id/2251015>
- Gaspar, R. and Antunes, D. (2011). Energy efficiency and appliance purchases in Europe: Consumer profiles and choice determinants. *Energy Policy*, 39, pp. 7335-7346.
- Geen, R.R., Beatty, G.G., Arkin, R.M. (1984). *Human motivation. Physiological, Behavioral, and Social Approaches*. Boston: Allyn and Bacon.
- Harwood, T. (2012). Emergence of Gamified Commerce: Turning Virtual to Real. *Journal of Electronic Commerce in Organizations*, 10 (2), pp. 16-39.
- Hunicke, R., Leblanc, M., Zubek, R. (2004). MDA: A Formal Approach to Game Design and Game Research. In *Proceedings of AAAI-04 workshop on Challenges in Game AI*, pp.1-5
- Huotari, K., and Hamari, J. (2012). Defining Gamification - A Service Marketing Perspective. In *Proceedings of the 16th International Academic MindTrek Conference*, Finland: Tampere.
- Kankanhalli, A., Taher, Mahdieh, Cavusoglu, H., Kim, S. H. (2012). Gamification: A New Paradigm for Online User Engagement. In *Proceedings of the International Conference on Information Systems, ICIS 2012*, Orlando, Florida, USA.
- Kapp, K.M. (2012). *The Gamification of Learning and Instruction: Game based Methods and Strategies for Training and Education*, San Francisco, CA: Pfeiffer
- Kong, J.S.L, Kwok, R.C.W, Fang, Y (2012). The effects of peer intrinsic and extrinsic motivation on MMOG game-based collaborative learning. *Information & Management*, 49 (1), pp. 1-9.
- Kosmadoudi, Z., Lim, T., Ritchie, J., Louchart, S., Liu, Y., Sung, R. (2013). Engineering design using game-enhanced CAD: The potential to augment the user experience with game elements. *Computer-Aided Design*, 45 (3), pp. 777-795.

- Koutropoulos, A. (2012). Academic Check-Ins: Mobile Gamification for increasing motivation. *Instructional Technology*, 9 (5), pp 3-20.
- Lee, J. J. and Hammer, J (2011). Gamification in Education: What, How, Why Bother?. *Academic Exchange Quarterly*, 15 (2), pp 1-5.
- Li, Z., Huang, K.W, Cavusoglu, H. (2012). Quantifying the Impact of Badges on User Engagement in Online Q&A Communities. In *Proceedings of the International Conference on Information Systems, ICIS 2012, Orlando, Florida, USA*
- Lounis, S., Neratzouli X., Pramataris K. (2013). Can Gamification Increase Consumer Engagement? A Qualitative Approach on a Green Case. In *Proceedings of the 12th IFIP Conference on e-Business, e-Services, e-Society (Doulgeris, C., Nineta, P. Karantjias, A., Lamersdorf, W. eds.)*, Athens, Greece, pp. 200-212
- Malone, T.W. (1980). What makes things fun to learn? A study of intrinsically motivating computer games. Technical Report CIS-7, Xerox PARC, Palo Alto.
- Malone, T.W., Lepper, M.R. (1987). Making learning fun: a taxonomy of intrinsic motivations for learning. In: Snow, R.E., Farr, M.J. (Eds.), *Aptitude, Learning and Interaction III Cognitive and Affective Process Analysis*. Lawrence Erlbaum, Hillsdale, NJ
- McManus, I.C. and Furnham, A. (2010) "Fun, Fun, Fun": Types of Fun, Attitudes to Fun, and their Relation to Personality and Biographical Factors. *Psychology*, 1, pp 159-168
- McGonigal J. (2011). *Reality is Broken: Why Games Make Us Better and How They Can Change the World* Penguin Books
- Nardi, B. and Harris, J., (2006). Strangers and friends: collaborative play in World of Warcraft. In *Proceedings of the 20th Anniversary Conference on Computer Supported Cooperative Work, Banff, Alberta, Canada*
- Nunnally, J. C., and Bernstein, I. H. (1994). *Psychometric theory*. Sydney: McGraw-Hill
- Robert D. Straughan, J., Roberts, A. (1999). Environmental segmentation alternatives: a look at green consumer behavior in the new millennium. *Journal of Consumer Marketing*, 16 (6), pp.558 – 575.
- Ryan, R.M., Rigby, C.S., Przybylski, A. (2006). The Motivational Pull of Video Games: A Self-Determination Theory Approach. *Motivation and Emotion* 30 (4), pp. 344-360.
- Ryan, R. M., and Deci, E. L. (2000). Self-determination theory and the facilitation of intrinsic motivation, social development, and well-being. *American Psychologist* (55), pp. 68-78.
- Salen, K. and Zimmerman, E. (2004). *Rules of Play, Game Design Fundamentals*. Cambridge, MA: MIT Press.
- Saltzman, M. (2000). *Game Design: Secrets of the Sages*. Second edition Indianapolis IN: Macmillan Publishing.
- Sampanes, A.C. (2013) Gamifying Support. In *Proceedings of the 15th International Conference on Human-Computer Interaction HCII 2013, (Kurosu M Eds.): Human-Computer Interaction, Part II*, pp. 284-291.
- Simões, J., Redondo, R. D., Vilas, A. F. (2012). A social gamification framework for a K-6 learning platform. *Computers in Human Behavior*, 23 (2), pp 345-353.
- Simon, F. and Usunier, J.-C. (2007). Cognitive, demographic, and situational determinants of service customer preference for personnel-in-contact over self-service technology. *International Journal of Research in Marketing*, 24, pp. 163-173.
- Taylor, T.L (2006). *Play between worlds: Exploring online game culture*, Cambridge: MIT Press

- Theotokis, A., Vlachos P.A., Pramataris, K. (2008). The moderating role of customer-technology contact on attitude towards technology-based services. *European Journal of Information Systems*, 17, pp. 343-351.
- Thom, J., Millen, D.R., DiMicco, J. (2012) Removing Gamification from an Enterprise SNS. In *Proceedings of the ACM 2012 Computer Supported Cooperative Work Conference*, Seattle Washington, USA, pp. 1067-1070
- Vansteenkiste, M., Lens, W., Deci, E. L. (2006). Intrinsic versus extrinsic goal contents in self-determination theory: Another look at the quality of academic motivation. *Educational Psychologist*, 41, pp. 19-31.
- Venkatesh, V., Morris, M.G., Davis, G.B., Davis, F.D. (2003). User Acceptance of Information Technology: Toward a Unified View, *MIS Quarterly*, 27 (3), pp. 425-478.
- Xu, Y., Poole, E.S., Miller, A. D., Eiriksdottir, E., Catrambone, R., Mynatt, E. (2012). Designing pervasive health games for sustainability, adaptability and sociability. In *Proceedings of the International Conference on the Foundations of Digital Games*, New York, USA, pp. 49-56.
- Yee, N. (2006). Motivations for Play in Online Games. *CyberPsychology & Behavior*, 9 (6), pp. 772 - 775.
- Zichermann, G. and Cunningham, C. (2011). *Gamification by Design: Implementing Game Mechanics in Web and Mobile Apps*, O'Reilly Media.