

Gamification in Academia Practice – What Motivate Users Most

Ming-Shiou KUO^{a*}, Tsung-Yen CHUANG^a, Ting-Chieh CHUANG^a, Po-Yu CHEN^a & Hsin-Chih LIN^a

^a*Department of Information and Learning Technology, National University of Tainan, Taiwan*

*ccmitchellkuo@gmail.com

Abstract: Gamification is the use of game design elements and game mechanisms in non-game context to increase audience's motivation and engagement. Not only being applied on the commercial market to attract consumers, gamification is also used in educational context by teachers to help keeping students engaged and motivated in the physical classrooms. This paper furthermore upraises the discussion of how the gamification strategies can be implemented online for a website with academic purposes to retain its members, and what of which are the members' most concerns a designer should adapt to if time and resource are limited. Examples are given and an online survey of 73 subjects with empirical experience was conducted to reveal that among those game mechanisms proposed, the graphical feedbacks are the subjects' most concerns, followed by the gamified theme activity and discussion board. For websites which are not gameplay purposed this paper could provide useful suggestions for the designers who try to use gamification for enhancing the audience's participation and enthusiasm, even for educational purposes.

Keywords: Gamification, Game mechanisms, Game elements, Motivation, Engagement

1. Introduction

Gamification, an emerged trend of using game mechanisms or elements in non-game context for increasing audience's motivation and engagement, needs more designers' efforts to arrange and carefully implement for integrating with the non-game target than just design a pure game. It is more likely that game designers try from the beginning to pack a non-game target by using game design strategies for the insipid and unattractive content or context concerned by the audience. The concept is based on that the game elements in entertaining video games should be able to make other, non-game applications more enjoyable and engaging as well (Flatla, Gutwin, Nacke, Bateman, & Mandryk, 2011). However, the definition of game elements and how to use it for gamification brings up debates among researchers and will be discussed in the later literature review section.

Non-game content or context covers many domains including commercial market and education, therefore the purpose of applying gamification could be at least divided into two different perspectives: organization benefit and meaningfulness for students or the target audience. Nicholson (2012) argues that the long-term benefits to the company eventually result from the positive and meaningful benefits for the user, therefore a user-centered theoretical framework was proposed, in theory and in ideal condition. However, for short lifetime products or for promotion in the competitive market, a gamification designer is inevitably bound with limited time, budget and the needs of the organization, therefore our study tries to identify what mechanisms are most concerned or welcomed by the target audience to save the designers.

Another setting of this study is putting the gamification online. Take gamification in education for example, in most real cases gamification is implemented in just the physical classroom for teaching. In which context a teacher can easily arrange or modify the gamification strategy in a controllable environment for gathered students, however to digitize the gamification strategy or mechanisms online is a different thing, and usually ignored in many gamification 101 guidelines for education (Fioriello, 2013; Lepi, 2013). The survey samples of this study were then collected online from those who have the experience of visiting membership websites with gamification applied digitally. The membership sites may be an educational platform with personnel account setting, or a commercial site with lucky draw

games, or a forum with different discussion boards. One thing in common among those sites is their goals of retaining and increasing the members' engagements and motivations for visiting. We hope that through this survey and discussion, valuable efficiency gamification design data could be provided for future related research.

2. Literature reviews

Gamification uses game-thinking and playful design in non-game context as a motivational tool to engage people (de-Marcos, Domínguez, Saenz-de-Navarrete, & Pagés, 2014). Ryan and Deci (2000) distinguished motivation into two types, the intrinsic and extrinsic motivation in their early Self-Determination Theory (SDT). Based on the reasons or goals that give rise to an action, the intrinsic motivation refers to people doing something because it is inherently interesting or enjoyable, while the extrinsic motivation refer to doing something because it leads to a separable outcome, e.g., rewards, punishments or pressures. In the classic literature extrinsic motivation has typically been characterized as a low quality form that contrasts with intrinsic motivation, yet in Ryan and Deci's taxonomy the extrinsic motivation still plays an important role and has the great opportunity to internalize and integrate with the external regulation therefore results in an orientation shift, Deci furthermore discussed the effects of all rewards and did explicit analyzing to clear that the understanding of intrinsic motivation by tangible rewards is indeed a significance issue (Deci, Koestner, & Ryan, 2001).

Wang and Sun (2011) further linked the usage of reward system as the extrinsic motivation for video game experience. They discussed how game reward systems can be used to motivate or change behaviors in the physical world, as well as how reward mechanisms foster intrinsic motivation while giving extrinsic rewards. Eight virtual reward forms in digital game worlds were proposed including score system, point system like experience point, item granting system, virtual resources like wood and stone for building facilities in certain games, achievement system, feedback messages as instant reward, plot animation and pictures like cutscenes and badges, and unlocking mechanism for accessing new game content. These reward forms give clues for our later gamification design on how to provide positive player experiences, establish status, attract attention, and help players building social connections with others.

For the nature of gameplays the inherent fun, interesting and enjoyment of games can be typically linked to the intrinsic motivation and considered as a high quality form, therefore many discussions of game-based learning, game-based training, or serious games which use an off-the-shelf game as a medium or as a game-based motivational tool to engage the target audience are emerging in recent years. However if there is no existing game for increasing people's motivation of doing something that is inherently without fun and enjoyment, the alternative approach which uses the advantage of game's motivation linkage to repack the insipid task with a game form, in other words, to gamify a non-game activity for increasing people's engagement, is gamification promisingly.

Since a non-game context is different from games from the bottom, it is hard to just find and extract a fine game's subtle core spirit to replace the non-game's heart. That is why most gamification theorists turn to discuss the game design elements, game mechanisms and strategies to try building the guidelines for gamifying the targets. Brathwaite and Schreiber (2009) use the term game design atoms to introduce the elements of games, including the game states, a collection of all relevant virtual information that may change during play; players, avatars and game bits - the art assets such as icons, sprites, objects, NPCs or monsters; the game mechanics which are rules acting upon the above to change the game state and are the ingredients of game design, not to mention the game dynamics, goals and theme.

Reeves and Read (2009) argues that some so called game elements like avatars, ranks, levels, time pressure, competition rules and some other ingredients can also be found outside of games or are not necessarily in different game genres, therefore would not be readily identified as 'gameful', let alone game specific. In addition, how game elements are perceived can be a very subjective judgment depending on different perspectives of designers or players.

Since what game elements are is still need to be discussed, Deterding, Dixon, Khaled, and Nacke (2011) restrict gamification to the description of elements that are characteristic to games, and reserve the term for the use of gamifying design. Although the definition may bring up another debate

for what is “characteristic” of games, their proposed levels of game design elements give the practitioner a direction to design gamification, show as table 1 below.

Table 1: Levels of Game Design Elements (Deterding et al., 2011)

Level	Description	Example
Game interface Design patterns	Common, successful interaction design components and design solutions for a known problem in a context, including prototypical implementations	Badge, leaderboard, level
Game design patterns and mechanics	Commonly reoccurring parts of the design of a game that concern gameplay	Time constraint, limited resources, turns
Game design principles and heuristics	Evaluative guidelines to approach a design problem or analyze a given design solution	Enduring play, clear goals, variety of game styles
Game models	Conceptual models of the components of games or game experience	MDA; challenge, fantasy, curiosity; game design atoms; CEGE
Game design methods	Game design-specific practices and processes	Playtesting, playcentric design, value conscious game design

As can be seen in table 1, game interface design patterns with implemented solutions such as badge and leaderboard, are distinguished from game design patterns or game mechanics which can be implemented with many different interface elements, therefore are more abstract and treated as distinct.

Besides those models and theories proposed in the academic research, from commercial market a gamification agency Bunchball.com publishes its white paper to link human desires as game dynamics with game mechanics, such as points, levels, challenges, leaderboards, gifting and charity. Table 2 from Bunchball.com gives a clear picture of how each game mechanic interacts with human desires, respectively. The black dots signify the primary desire a particular game mechanic fulfills, and the white dots show the other areas that it affects.

Table 2: The interaction of basic human desires and game play, adapted from Bunchball.com (2010)

Game Mechanics	Human Desires					
	Reward	Status	Achievement	Self Expression	Competition	Altruism
Points	●	○	○		○	○
Levels		●	○		○	
Challenges	○	○	●	○	○	○
Virtual Goods	○	○	○	●	○	
Leaderboards		○	○		●	○
Gifting and Charity		○	○		○	●

The implemented solutions above for gamification are now often seen in many websites with membership registration to record each member’s performance or engagement by accumulated points, level, leaderboard and other game interface design mechanisms such as badges and trophies (de-Marcos et al., 2014; Domínguez et al., 2013). Although using virtual pictorial reward is considered as task-contingent, performance-contingent or completion-contingent rewards which is categorized into extrinsic rewards (Deci et al., 2001) and will decrease intrinsic motivation, many commercial operations still use extrinsic rewards including tangible, material ones, e.g., money and prizes, to attract potential customers. From instructional aspect the decreasing of intrinsic motivation may result in students’ low learning performance, however in commercial marketing perspectives, it is worthy to use

extrinsic rewards like lottery or draw lots to promote the sales of a short-lifetime product, therefore we regularly argue that a full understanding of the gamification purposes in different context with additional factors and considerations is necessary.

To sum up, games are typically considered to provide joyful intrinsic motivation, and gamification tries to parse that characteristic of games for applying on the non-game applications. Because people may lack intrinsic motivation for non-game applications, extrinsic motivation such as rewards or other regulations may be necessary for the gamifying process to engage people. In the above reviews many game design mechanisms are discussed, yet from the gamification experienced users' perspective, which mechanism brings up the most motivation or is not essential, is still need to be explored for efficient gamification design.

3. Methods and implementation

An online survey was used to investigate the expectations of subjects regarding the usage of the game interface design elements in their favorite membership websites. To assure that all subjects at least have experienced one membership website with gamification mechanisms, the survey is deployed on our multi-purposes platform, LOPUPA (<http://lopupa.npust.edu.tw>), “learning on projects of united promotion for academia.” The ultimate goal of the platform design is to gamify the process of academic activities in the National Pingtung University of Science and Technology, NPUST. Faculties can use the platform to introduce or promote their projects or research outcomes, students can demonstrate their projects for feedbacks, other members can interact with the non-game educational context and become research samples, industries can contact the faculties, students and members for cooperation opportunities or marketing purposes.

Game design mechanisms are implemented in the platform including points, leaderboards, challenges and rewards, etc. Table 3 describes the design of point mechanism in LOPUPA, three types of point are introduced, and the tangible rewards system is shown in fig. 1.

Table 3: The point mechanism in LOPUPA

Point type	Obtain methods	Purpose
Experience Point	Personnel engagement with LOPUPA: Logins, participating online single player activities, responding online surveys.	Quantitate the interactions between user and the system
Charisma Point	Social engagement in LOPUPA: Using discussion boards, participating online multi-user activities to interact with other users.	Quantitate the interactions among users.
Gift Point	converted by activity rules: $X*(EP) + Y*(CP) - GP \text{ spent for gifts} = GP$ X, Y depends on each activity design.	Virtual currency to convert user performance for exchanging real incentive gifts as tangible rewards.



Figure 1. The reward system for gift point exchange

The thematic activities and web games are also provided to introduce and engage people in NPUST content made by its faculties and students, fig. 2 shows the portal. As described in table 2, these challenging arrangements may fulfill the human desires for competition, achievement and more, including self-expression as one of the LOPUPA members shows his/her complete collection of collectable cards in the Hakka activity discussion board as in fig. 3.



Figure 2. The thematic activity and thematic web game module

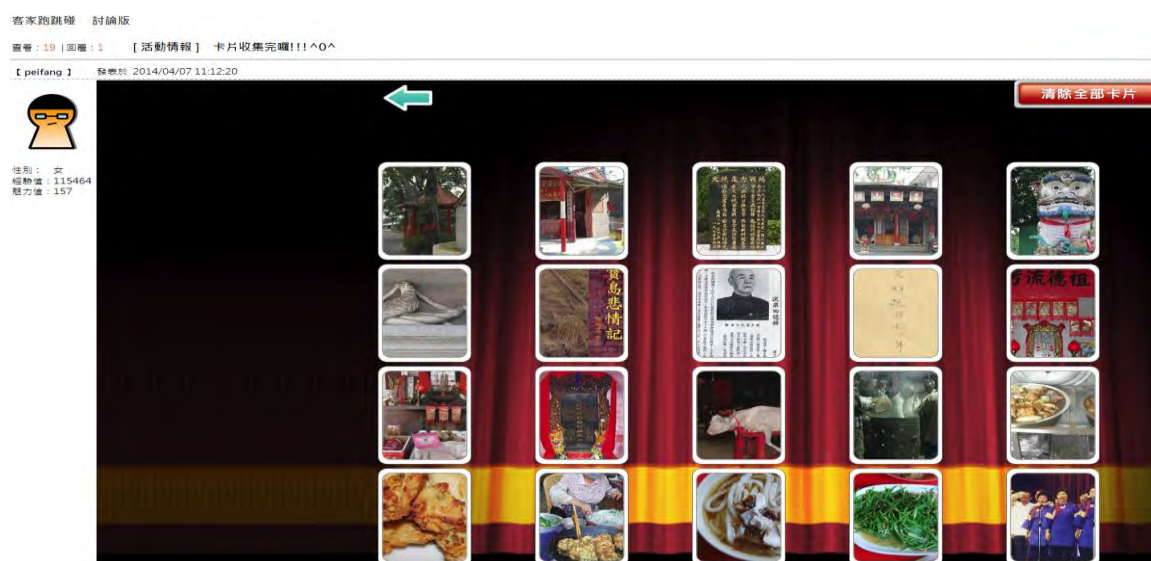


Figure 3. The LOPUPA member who first completed collecting all collectable cards in an activity posted his/her achievement in the discussion board

With the deployment and implementation above, our survey subjects are registered members who are exposed to the gamification platform and aware of the mechanisms, therefore their answers and suggestions could reflect the authentic responses for improving gamification strategies in the future.

4. Results and Conclusion

A Likert-type seven-point scale with options ranged from 1 (very disagreeable) to 7 (very agreeable) is deployed, and 73 members responded. The result of the questionnaire showed the top three mean values fall into: Graphical incentives is a must have to make my determination more strong for completing the online theme activity or web games ($M = 5.59$, $SD = 1.41$); Online theme activity or thematic web games of a membership website can keep my interest and retain my visits ($M = 5.55$, $SD = 1.41$); and Discussion board is a must have to open my communication with other members or web administrators to keep my enthusiasm ($M = 5.55$, $SD = 1.41$).

The survey reveals that graphical virtual feedbacks such as trophies, badges or collectable cards, the theme activities or web games and the discussion board are the top three welcomed

gamification methods. These finding could be explained as follows accordingly: members like to have their online self-fulfillment displayed in graphics, members' retention are mainly because they have interests in the theme activities regarding the website property, and members like to have community interactions by social tools which has been proofed in de-Marco's gamification and social networking study. On the contrast, the leaderboard has the lowest score comparatively, suggesting that displaying accomplishments for competition with others is not so important from the members' perspectives.

Although the tangible rewards are not attractive enough to make it on the top of the list in our study, in the open question section of the survey, some members do respond with the expectations of gift varieties, lower point thresholds for gift exchanging, and having a lottery instead of accumulating gift points by continuously participating the theme activities or web games. However we must consider the balance between the members' wishes and the organization's gamification purposes and resource, making the strategy of proper balancing issue our future considerations, including the frequency of developing new theme activities or thematic web games.

This article reports the empirical investigation of gamification for educational promotion context. Unlike small classroom surveys in other similar gamification researches, a gamified platform LOPUPA was established with faculties, students, visitors and industries involved, and an online survey was conducted to understand which mechanisms are the most important for members' retention and engagement through the internet. Our future work will include the further analysis of how users interact with the strategy from the play theory's point of view, and the implementation of Google Analytics to retrieve the global view of user behaviors. The digital gamification services or web designers therefore could be benefited by our research outcomes.

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