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How gamification motivates visits and engagement for online academic dissemination — An empirical study

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ABSTRACT

Gamification, an emerging trend of using game mechanisms or elements in non-game contexts for commercial or educational purposes, has been applied in advertisements, competitions and rewards for many years. Although gamification could easily be applied to various daily activities, challenges arise when digitizing it for use online with educational applications. The purpose of this study is thus to apply gamification to an online context for academic promotion and dissemination. An online platform was designed to involve faculty members, students, and visitors from industry and the general public to form groups for the mutual dissemination of academic knowledge, products and activities. Both quantitative and qualitative data were collected and analyzed. The findings with regard to the most significant game design elements are discussed, along with the statistical results related to the engagement behaviors demonstrated by the participants. The quantitative data provided by the online analytical tools to examine user behaviors reveals that gamification has the potential to attract, motivate, engage and retain users. The system implementation used in this work is described, and provides empirical examples of how gamification impacts user behaviors in this context. This study also demonstrates how the theory and practice of online gamification for use in academia can be connected.

1. Introduction

Play is a range of voluntary, intrinsically motivated activities normally associated with recreational pleasure and enjoyment (Garvey, 1990), and can be seen as a behavior reflecting the basic desire for relaxation and entertainment. Games are an exterior expression of play, and involve sets of rules, activities and various types of gameplay in order to achieve an ultimate purpose, namely fun. Gamification, an emerging trend of using game mechanisms or elements in non-game contexts to increase an audience or user's motivation and engagement, requires considerable efforts to integrate more playful components with the non-game target, in contrast to simply designing a pure game for entertainment. This move is based on the concept that the entertaining elements in video games should be able to make other, non-game applications more enjoyable and engaging (Flatla, Gutwin, Nacke, Bateman, & Mandryk, 2011). In other words, gamification has the potential to augment the user experience with game elements in many non-game contexts, with applications in the commercial market and education (e.g., Anderson, 2014; Kosmadoudi et al., 2013; Simões, Díaz Redondo, & Fernández Vilas, 2013).

Gamification can thus be seen from two different perspectives, based on the organizational benefits it can bring, and the greater meaningfulness of the focal content for the target audience, such as students. Nicholson (2012) argued that the long-term benefits of gamification to a company result from the positive and meaningful benefits that are received by the customers, and thus a user-centered theoretical framework of gamification was proposed, based on theory and under ideal conditions. However, for short product promotions in a competitive market, or for short semesters in school, designers working on gamification inevitably face constraints with regard to a limited time, budget and the demands of the organization, making detailed needs analysis for each student or customer almost impossible. Therefore, identifying what mechanisms are of most concern or most welcomed by the target audience can save such designers considerable time and effort, and this is the focus of the current work.

Although gamification can be readily applied in many daily-life activities, e.g., prize draws for product promotion or a small gift for the student who completes an assignment first, more challenges

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arises when putting it online. Take gamification in education, for example, where in most real cases it is implemented only in the physical classroom. In this context a teacher can easily arrange or modify the gamification strategy in a controllable environment for a known group of students. However to digitizing the gamification strategy or placing the related mechanisms online is very different, and such issues tend to be undiscussed in many of the basic guidelines to this teaching approach (e.g., Fioriello, 2013; Lepi, 2013). In this study we expand the scope of gamification from the classroom context to a university level, with a focus on the dissemination of academic information. National Pingtung University of Science and Technology (NPUST) is located in the outlying area of southern Taiwan, and the poor transport connections and remote location mean that many of the academic activities carried out at this institution are geographically disadvantaged with regard to attracting visitors to attend personally, and thus network technology is especially useful in this context. However traditional websites tend to contain a lot of static information, or the use of complex search engine optimization (SEO) mechanisms, and these do not seem be very efficient with regard to attracting, engaging and retaining visitors, and another reason for this may be that academic information is usually considered to be abstruse and uninteresting. This provides an opportunity for online gamification to be applied. First, the non-game academic context and content may become more attractive and interesting with the use of gamification strategies, increasing the possibility that it will be seen by more people than just serious scholars. Second, the results of the research and development works carried out by NPUST faculties and students may be more widely disseminated using a combination of gamification and online technology. Third, the greater visibility of academic information that this approach could enable may lead to beneficial relationships between the university and industry, as well as help to establish cooperation with academics in Taiwan and abroad. Finally, through the empirical practice of online digital gamification carried out in this work, the gap between theory and practice could be bridged.

This study develops an online gamification platform, the website LOPUPA, for the purpose of disseminating academic information at the university level. If a web visitor can stay longer and browse and engage with more content regarding the activities and products developed by the students and faculty members that are advertised on a certain page, not only will the community cohesion be increased, but also the visibility of the university will be promoted. Based on the use of the website population and the LOPUPA website gamification survey, the key designs of gamification strategies are revealed from the users' point of view. The platform visitors' behaviors will also be discussed, based on data obtained from Google Analytics, along with our other system modules. Details of the system structure and implementation will be presented, along with the conclusions of this work and some directions for future research.

2. Literature review

Gamification is a relatively new concept originating from the domain of digital media (Deterding, Khaled, Nacke, & Dixon, 2011). Although the term was first used in 2008, it only gained widespread recognition in the second half of 2010, when it appeared in a number of conference presentations and was adopted by many industries. For this reason it does not seem appropriate to restrict any study of gamification to a review of publications in highly ranked magazines, journals or conferences papers (Thiebes, Lins, & Basten, 2014). Gamification uses game-thinking and playful design in non-game contexts, as a motivational tool to engage users (de-Marcos, Domínguez, Saenz-de-Navarrete, & Pagés, 2014). Ryan

and Deci (2000) distinguished motivation into two types, intrinsic and extrinsic, in their Self-Determination Theory (SDT). Based on the reasons or goals that give rise to an action, intrinsic motivation refers to people doing something because it is inherently interesting or enjoyable, while extrinsic motivation refers to doing something because it leads to a separable outcome, e.g., receiving a reward, avoiding punishment or reducing pressure. 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 (2000) taxonomy such motivation still plays an important role, and provides a good opportunity to be internalized and integrated with external regulation, thus resulting in a shift in orientation. Deci, Koestner, and Ryan (2001) further discussed the effects of various kinds of rewards, including verbal rewards, tangible rewards, unexpected rewards, and completion-contingent rewards and, on the basis of their analysis concluded that the understanding of intrinsic motivation based on tangible rewards is a significant issue.

Wang and Sun (2011) further examined the usage of reward systems as a form of extrinsic motivation in the 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 in their work, including a scoring system; a point system (giving points for experience); item granting system; the use of virtual resources, like wood and stone, for building things in certain games; achievement system; feedback messages as instant rewards; animated scenes and images, like cutscenes and badges; and unlocking mechanism for accessing new game content. The features of these forms of reward can be used in gamification design, as they can help to provide players with positive experiences, establish status, attract attention, and enable users to build social connections with others.

Since games are inherently fun, they are typically linked to intrinsic motivation, which is considered as a high quality form of motivation, thus in recent years there have been many discussions of game-based learning, game-based training, or serious games which use certain off-the-shelf games as a medium or as a game-based motivational tool to engage the target audience. However if there are no existing games that can be used to increase people's motivation to do something that is inherently unenjoyable, then there is an opportunity to gamify the focal non-game activity to increase people's engagement and motivation with it.

Most gamification theorists focus on discussions of the game design elements, game mechanisms and strategies needed to gamifying a target activity. Brathwaite and Schreiber (2009) used the term game design atoms to introduce the basic 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 elements 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) noted that some so-called game elements like avatars, ranks, levels, time pressure, and competition rules, can also be found outside of games or are not necessarily in different game genres, and thus cannot be readily identified as 'gameful', let alone game specific. In addition, how game elements are perceived can be very subjective, depending on the different perspectives of designers or players.

Since the nature of various game elements still needs to be discussed, we align our understanding of gamification with the systematic literature review done by Thiebes et al. (2014), which was nominated for the best paper award at the 2014 European