Do badges increase user activity? A field experiment on the effects of gamification

Juho Hamari[*]

Game Research Lab, School of Information Sciences, FIN-33014 University of Tampere, Finland
Department of Information and Service Economy, Aalto University School of Business, P.O. Box 21220, 00076 Aalto, Finland

ARTICLE INFO

ABSTRACT

During recent years, the practice of adding game design to non-game services has gained a relatively large amount of attention. Popular discussion connects gamification to increased user engagement, service profitability, goal commitment and the overall betterment of various behavioral outcomes. However, there is still an absence of a coherent and ample body of empirical evidence that would confirm such expectations. To this end, this paper reports the results of a 2 year (1 + 1 year — between-group) field experiment in gamifying a service by implementing a game mechanic called 'badges'. During the experiment a pre-implementation group ($N = 1410$) was monitored for 1 year. After the implementation, the post-implementation (the gamified condition) group ($N = 1579$) was monitored for another full year. Results show that users in the gamified condition were significantly more likely to post trade proposals, carry out transactions, comment on proposals and generally use the service in a more active way.

1. Introduction

During recent years, the boundary between games and other systems and services has become increasingly blurred. This development can be seen to be bi-directional: On one hand, within games, users are increasingly subjected to decision making situations pertaining to outside-game concerns (especially with the rise of Free-to-play games about how people use money — Alha, Koskinen, Paavilainen, Hamari, & Kinnunen, 2014; Hamari, 2015; Hamari & Järvinen, 2011; Hamari & Lehdonvirta, 2010; Paavilainen, Hamari, Stenros, & Kinnunen, 2013). On the other hand, in non-game contexts, game design is increasingly being used to direct people's motivations towards intrinsically motivated, gameful experiences and behavior (Deterding, Dixon, Khaled, & Nacke, 2011; Hamari, Huotari, & Tolvanen, 2015; Huotari K. & J., 2012; McGonigal, 2011). This phenomenon is commonly referred to as gamification (Deterding et al., 2011; Hamari et al., 2015; Huotari & Hamari, 2012). Gamification has already been applied in several areas, including the promotion of greener energy consumption (Nissan Leaf), building loyalty towards TV channels

(GetGlue), taking care of one's health (Fitocracy), and even for gamifying the tracking of one's aspirations in life (Mindbloom). Predictions about the diffusion of gamification have varied from extremely positive outlooks (e.g. Gartner, 2011; IEEE, 2014 — Most organizations will adopt gamification strategies in the near future), to less optimistic ones (Gartner, 2012 — most adoptions will fail).

Popular positive belief in the effectiveness of gamification has often been based on the anecdotal conception that because most games are 'fun' and intrinsically motivating, then any service that uses the same mechanics should also prove to be 'fun' and effective in invoking positive further behavioral outcomes. It is clear that gamification has attracted significant interest and opinion, although its conceptions remain scant and there is a relative dearth of a coherent body of empirical evidence on its effectiveness. Moreover, meta-studies have detected that the field is strongly dispersed and often afflicted with sub-par study designs with regards to controls, sample sizes and experiment durations (see Hamari, Koivisto, & Pakkanen, 2014a; Hamari, Koivisto, & Sarsa, 2014b). Therefore, it is not surprising that the discussion around gamification is still relatively divergent.

In this paper, we studied the effects of gamification (a badge system) on user activity in a sharing economy service (a peer-to-peer marketplace). In our experiment, people could unlock badges by completing common actions and tasks within the

* Address: Game Research Lab, School of Information Sciences, FIN-33014 University of Tampere, Finland. Tel.: +358 50 318 6861.
E-mail address: juho.hamari@uta.fi.

service. The experiment focused on investigating whether the implementation of badges positively affects usage activity. Since the experiment was carried out in a peer-to-peer marketplace, usage activity was measured via four related dependent variables: the amount of posted trade proposals, accepted transactions, posted comments, and general usage activity as measured via page views. The field experiment spanned 2 years $(1 + 1$ year − between-group). During the experiment a pre-implementation group $(N = 1410)$ was firstly monitored for 1 year. After the implementation, a post-implementation group $(N = 1579)$ was monitored for another full year.

2. Background

2.1. Related literature

Industry studies have found that the addition of badges to games has led to better critical reception and increased revenue (Electronic Entertainment Design, 2007). In fact, large game console publishers such as Microsoft, demand that game developers include badges in games that are published for Xbox consoles (see Jakobsson, 2011). However, there is a dearth of literature as to how badges affect user behavior in a gamification setting where users are not predisposed to gaming.

Badges consist of optional rewards and goals, the fulfillment of which is located outside the scope of the core activities of a service. On a systemic level, a badge consists of a signifying element (the visual and textual cues of the badge), rewards (the earned badge), and the fulfillment conditions which determine how the badge can be earned (Hamari, 2013; Hamari & Eranti, 2011; Jakobsson, 2011; Montola, Nummenmaa, Lucerano, Boberg, & Korhonen, 2009). Furthermore, because of their visual element (the badge itself) and the included descriptions regarding the goal and how to unlock a badge, they may also be accompanied by narrative elements and challenges that have been found to give rise to intrinsic motivations (Malone, 1981).

Badges have been one of most common mechanics investigated in gamification studies and studied in a variety of contexts (Hamari et al., 2014b) (Table 1). In an educational context, Domínguez et al., 2013 found that while badges did have a positive effect on practical assignments, they had a possible negative effect on written assignments. Hakulinen, Auvinen, and Korhonen (2013) found that results depend upon the badge type, as well as the users. Denny (2013), on the other hand, found only positive effects regarding the level of contributions, as well as on the time a student engaged with the system.

In a commerce context, Hamari (2013) found that enabling people to compare their badges and to use them as service user goals, had little significant effect on either the amount or quality of service use. However, those people who actively followed up on the accumulation of badges showed an increased service use.

Two studies (Fitz-Walter, Tjondronegoro, & Wyeth, 2011; Montola et al., 2009) share the observation that badges can have both positive and negative consequences. Undesirable usage patterns were deemed to be a potential problems as badges might entice users to excessively carry out those activities that award badges. The impact of badges on usability and their integration into the existing system were also considered as possible problems.

2.2. Theoretical underpinnings

According to Bandura (1993), set *goals* (such as those in badges) increase performance in three ways: (1) people anchor their expectations higher, which in turn increases their performance; (2) assigned goals enhance self-efficacy; (3) the completion of goals

leads to increased satisfaction, which in turn leads to increased future performance within the same activities. These effects are further strengthened if the goals are context-related, immediate, and the users are provided with (immediate) feedback. It has also been found that when goals are clearly specified in terms of how many times they have to be completed, the rate of completion of the tasks increases (Ling et al., 2005).

Another effect noted from using badges has been connected to their ability to guide user behavior because they set *clear goals*. It has been argued that badges function as a guidance mechanic (Hamari & Eranti, 2011; Jakobsson, 2011; Montola et al., 2009) in a service, providing the user with an idea of how the service is meant to be used and what is expected of the user, thus increasing the *amount* and *quality* of those actions within a service. In a larger context, goals are regarded as a central game mechanic (Salen & Zimmerman, 2004), and have been demonstrated to exert persuasive power even when the progression towards them was illusionary (Kivetz, Urminsky, & Zheng, 2006; Nunes & Drèze, 2006). Clear goals are also one of the main dimensions of flow theory (Csíkszentmihályi, 1990) which predicts that having clear goals and immediate feedback supports the emergence of a 'flow state', where the user's skills and the challenge of the task are optimally balanced.

Even though users may be offered clear goals as described above, they need to be committed to these goals in order for the hypothesized effects of increased motivation, engagement and performance to take place (Klein, Wesson, Hollenbeck, & Alge, 1999). According to Locke and Latham (1990), *goal commitment* can be defined as one's determination to reach a goal, implying that users are more likely to persist in pursuing goals and be less likely to neglect them.

Another rationale behind gamification has been to harness the persuasive power that emerges when people compare their points and badges amongst each other, effectively benchmarking themselves. In general, this phenomenon is called *social comparison* (Festinger, 1954), and this forms an over-arching concept for other more specific theories related to effects which result from comparisons between individuals such as *social influence* and the theory of planned behavior (Ajzen, 1991). The social influence and recognition that users receive through gamification have also been found to be strong predictors for the adoption and use of gamification applications (Hamari & Koivisto, 2013).

Social proof theory (Cialdini, 2001a, 2001b; Goldstein, Cialdini, & Griskevicius, 2008) predicts that individuals are more likely to engage in behaviors which they perceive others are also engaged in (Cialdini, 2001b). Gamification via badges facilitates social proof by providing a means for users to observe the activities of others, and indicating which behaviors they have been rewarded for − "*We view a behavior as correct in a given situation to the degree that we see others performing it*" (Cialdini, 2001b). The other side of this phenomenon is *social validation*, by which people signal their conformity, in that they have also engaged in same behaviors. Van de Ven, Zeelenberg, and Pieters (2011) found that people were willing to pay up to 64% more for a product that their peers had already acquired. Badges facilitate social validation by providing a means for users to display their conformity to the behavior and expectations of others.

3. Methods and data

According to a literature review on gamification, Hamari et al. (2014b), conclude that many empirical studies on gamification have suffered from methodological limitations. For instance, the studies have often had relatively small sample sizes, have been conducted in makeshift services, their experiments have lacked