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Strengthening gamification studies: Current trends and future opportunities of gamification research

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1. Introduction

Gamification has become a well-established technique in Human-Computer Interaction (HCI). It refers to the transformation of systems, services, organizations and activities to afford similar experiences, motivations and skills as good games (Huotari & Hamari 2017). Over recent years, practitioners have attempted to exploit the motivational "power" of game design in domains as diverse as work, fitness tracking, health and wellbeing, education, commerce, learning, crowdsourcing, information retrieval, and organization engagement (e.g., Nah et al., 2014; Seaborn & Fels, 2015; Johnson et al., 2016; Warmelink et al., 2018; Morschheuser et al., 2018).

Early scholarship on gamification was driven primarily by the design and evaluation of gamified prototype applications and services. Researchers typically sought to demonstrate that gamified systems produce better outcomes than non-gamified systems. More recently, progress has been made in understanding the mechanisms through which gamification can bring about those outcomes. In particular, research has focused on how individual game mechanics can impact upon individual behavioral outcomes. Such advancements have encouraged commentators to suggest that gamification research has reached maturity. For example, Nacke & Deterding (2017), in the introduction of a recent special issue on gamification published in Computers in Human Behavior, highlighted that gamification research is undergoing a deep transformation moving from fundamental questions of "what?" and "why?," to questions around "how?," "when?," and "how and when not?."

Despite this progress, research on gamification still faces a variety of empirical and theoretical challenges. Firstly, empirical studies of gamified systems still typically focus narrowly on evaluating and understanding individuals' short-term interactions with the system, ignoring more difficult to measure outcomes, such as changes in people's social relationships due to participation, and deleterious effects of extrinsic rewards on intrinsic motivation. Furthermore, very little empirical work has yet examined the impact of contextual factors and individual differences on the effectiveness of gamification. A more nuanced use of theory to define hypotheses and explore novel research questions could help on this point. In 2015, Seaborn and Fels (2015) noticed that a major issue of gamification studies was the disconnection between theoretical and applied work: on the one hand, theoretical work was not empirically validated with respect to applied gamification work; on the other hand, applied work referenced theory but did not explore its validity empirically. After three years, these concerns are even more pressing.

Secondly, academic research on gamification has been slow to improve the techniques and methods through which gamified systems and services are designed. In practice, gamification applications continue to employ a limited set of game elements, such as points, badges and leaderboards. Researchers, in turn, investigate what practitioners have implemented. However, this has also led to criticism that gamification research and practice are missing the full picture and that what is done and researched is awkwardly a simple version of what holistic gamification should look like. Gamification research has typically failed to engage critically and productively with the diverse and rich design practice of game designers (Rapp, 2017a; Morschheuser et al. 2018). For example, the literature on game design provides evidence of how games can engender playful,

thoughtful, transformative and profound experiences (e.g., Deterding, 2014; 2015; Harrer, 2013; Morschheuser et al. 2017; Seriff, 2018). The full range of game design expertise has not yet been employed in the design of gamified systems. Furthermore, the consideration by gamification researchers of game mechanics as discrete interoperable elements, each with well defined behavioral outcomes, which can be plugged in and out of systems with predictable consequences on the experience of players, contradicts much research on game design (Deterding, 2015). On the contrary, games are complex, dynamic systems, in which even small design changes can have huge impacts on the experience of players (Hunicke, LeBlanc & Zubek, 2004).

Third, current gamification research lacks a critical lens capable of exploring unintended consequences of designs as well as of questioning its own successes. Gamification scholars still avoid investigating potential side-effects of the game elements employed in gamified interventions, taking for granted that making a serious context more like a game is a valuable outcome (Rapp et al., 2016a). However, whether game elements are applicable to every domains of human life, and whether their employment is always desirable, are still open questions. A more reflective stance on design matters has spread across the majority of HCI domains in the last twelve years, as a result of the popularity of approaches ascribable to the third-wave HCI (Bødker, 2006), like reflective design (Sengers et al., 2006), speculative design (Gaver, 2012), slow technology (Odom et al., 2012), and critical design (Bardzell & Bardzell, 2013). Gamification research appears not to have fully adopted a critical lens to look at the presuppositions, implications and impacts of its designs.

Many research questions related to gamification, therefore, have not yet been addressed by HCI researchers. For example, what kinds of design approaches can create novel, more enjoyable, immersive, and pleasurable gamified systems? How, and to what extent, does gamification produce psychological effects on individuals? What gamification techniques are most effective? Are there fields in which gamification should not be employed? Is gamification affecting users in ways that go beyond its intentions? How can gamification afford spaces and opportunities for reflection and experiential learning regarding our own behavior?

The primary aim of this Special Issue “Strengthening gamification studies: critical challenges and new opportunities” was to provide a focus for people working on these types of research questions, by supporting reflection on how to move gamification studies a step forward. We invited submissions presenting original research in the form of deployed gamified systems embedding novel game elements, as well as rigorous quantitative and qualitative user studies, which may also explore theoretical reflections grounded in empirical results. We also encouraged submissions focusing on alternate reality games and serious games, where recreational and serious aspects are merged together, as they are all symptoms of how gameful aspects are currently seeping into the design of interactive systems.

2. Articles accepted in this special issue

We received 50 submissions, signaling the vitality of the gamification community. A common trait of the 14 articles published in this special issue is the methodological rigor with which authors have faced the challenges outlined above. Gamified designs are increasingly studied “in the wild,” i.e., in real or realistic contexts of use, with appropriate user groups, using medium- and long-term study designs. We identified three main themes in the articles accepted in this special issue, which we will use as a structure through which to introduce and summarize its contents: the determination to advance theory, improvements in design practice, and the adoption of a critical lens to uncover unintended impacts and side-effects of gamification designs. Such themes are not meant to be mutually exclusive, and many articles may be ascribed to two or more of these themes.

2.1 Advancing theory

The articles published in this special issue demonstrate a determination among gamification scholars to improve the quality and usefulness of theory in the field of gamification. There is a strong effort in defining precise research questions on the basis of existing theorizations and in determining the kind and size of the effects gamification has on individuals, and how such effects unfold, on the basis of relevant conceptualizations. Theories are used to explain the underlying psychological processes at work when interacting with gamified systems (e.g., van Roy & Zaman, 2018, Morschheuser et al., 2018), as well as to

predict the impact of specific gamified elements, thus leading to the design of likely more effective gamified applications (Landers et al., 2018).

Progress in how gamification research is working on theory is also visible in attempts to use empirical studies to develop new grounded theories of psychological mechanisms, when existing ones seem to fail to explain data (van Roy, Deterding & Zaman, 2018). Likewise, the willingness to define more rigorously the key concepts used in gamification discourse (Landers, Collmus, and Williams, 2018) shows that scholars are now aware of the need to homogenize language and build a common and original ground on which scaffold future research advancements. In this vein, validating theoretical instruments represents an important attempt to create shared reliable measures to drive and evaluate designs (Tondello et al., 2018).

2.1.1 Using theory

A number of articles in this special issue present empirical works based on well defined theoretical ground, allowing the authors to formulate circumscribed research questions, which in turn may move the theory forward.

Morschheuser et al. (2018) start from the observation that there is a lack of comparative studies across different gamification designs: more precisely, the effects of features that invoke different goal structures such as competition, cooperation, and inter-team competition have been ignored in gamification research. Drawing on social interdependence theory (Johnson, 2013), and goal-setting theory (Locke & Latham, 1990), they investigate how crowdsourcees' perceived enjoyment and usefulness, behaviors (e.g., crowdsourcing participation) and willingness to recommend crowdsourcing approaches are influenced by the use of cooperative, competitive, and inter-team competitive gamification. By conducting a field experiment with three independent groups, they find that inter-team competitions are effective in invoking enjoyment and can engage the highest levels of crowdsourcing participation, compared to pure competitive or pure cooperative gamification. Further, the findings point out that designers should consider cooperative instead of competitive design strategies to increase users' willingness to recommend crowdsourcing systems.

Berdun et al. (2018) build on the Systematic Multiple Level Observation of Groups (SYMLOG) theory about groups' dynamics (Bales, 1983) to develop an online version of the "Lord of the rings" board game aimed at automatically building a SYMLOG profile for each player based on her actions during the game. SYMLOG is a theoretical and structural coding system, which assumes that group activities can be classified along three dimensions: dominance vs. submissiveness, friendliness vs. unfriendliness, and acceptance vs. opposition to authority. The developed profile can then be useful to know which features each member should train to improve her collaborative skills and to predict the performance of the group. An experimental evaluation with 98 users assesses the similarity between the profiles generated by the game and the profiles derived from a SYMLOG questionnaire, finding that the game is able to accurately capture the players' collaborative profile for the first two dimensions, whereas the performance is lower for the last dimension. In this work, gamification is used as a "tool" for measuring the collaborative behavior of people, confirming its methodological relevance in experimental settings (see e.g., Rapp et al., 2016b).

Another important theoretical question is tackled by van Roy and Zaman (2018) who notice that research on the interaction with game design elements in educational settings has presented both desirable and undesirable outcomes, but that little progress has been made on establishing theoretical and empirical explanation of the underlying psychological processes that determine these outcomes. The authors suggest that Self-Determination Theory (SDT) (Deci & Ryan, 2004) can provide the necessary explanatory power, as it identifies specific psychological needs that can be met through participation in gamified activities. To examine the usefulness of SDT in this context, they conduct an experimental case study in which students engage with a gamified support platform designed according to the principles of SDT, embedding weekly challenges, badges and group competition. Results show that students state feeling autonomous, related and competent as a result of the implemented game elements. However, data also show the contextually-specific nature of game-based motivation, whereby game elements that support people in one or two of their basic psychological needs might equally thwart (an)other need(s). Moreover, situational factors are found to be important confounds that have implications for the way in which game elements are able to support students' needs.

Likewise, Landers, Collmus, and Williams (2018) notice that in the gamification literature, the causal effects of multiple game elements are typically confounded. By contrast, the intent of this paper is to understand the effects of a single game element alone, namely competition, isolated from the effects of other game elements. To this aim, the authors attempt to isolate competition from other elements in its effect on brainstorming performance. They involve 347 participants in an experimental study with two-cell between-subjects design: in the control condition a brainstorming task is performed online with no competition, whereas in the experimental condition competition game element is added to the brainstorming task. Participants are told that they are competing with someone else, but are not provided with any additional information, such as their own level of performance while brainstorming in the form of points, the level of performance of the person they are competing with, or the opportunity to change their performance in response to a score/feedback. What the authors find is a support for a causal and practically significant effect of competition on human behavior improving performance, even when implemented as the sole game element in a gamification intervention. Furthermore, they argue that the primary motivational effect of competition must have either occur via an unconscious influence (i.e., increasing amotivation) or by creating implicit extrinsic rewards for increased effort.

2.1.2 Developing theory

A number of articles published in this special issue engage with the exploration of novel theoretical issues.

Van Roy, Deterding, and Zaman (2018), for example, emphasize the importance of studying not just the effects of gamification, but understanding how gamification works (or not) on a psychological or functional level. The authors analyze how people undertaking a gamified course ascribed meaning to the various badges encountered during the course, with the goal of understanding better the process through which specific game design elements can engender motivation in users. The authors conduct a qualitative in-the-wild- diary study with 81 users. Study results surface nine distinct ways that people functionalise (i.e., subjectively ascribed meaning to) badges. For example, “encouraging” badges are interpreted as performance-contingent rewards, focusing on successfully completing an activity. “Goal-setting” badges, instead, work as calls for performing certain actions to a certain standard or end state, e.g., because this becomes an end in itself (badges as collectables), or because attaining badges positively reflects on the user's competence (badges as challenges). The important theoretical implication of this research is that simple design elements like badges do not reliably produce one specific motivational effect, but potentially hold diverse motivational functions. This implies that even testing isolated element-motivation links is bound to produce conflicting results and that the very construct ‘badge’ is underspecified to lead to reliable, replicable effect directions.

Where van Roy, Deterding, and Zaman focus on the multiple meanings that users may ascribe to simple game elements, Landers et al. (2018) directly engage in developing theory by focusing on one of the central concept of gamification, namely “gamefulness.” The authors suggest that the term is loosely defined in current literature, relying on researchers applying their own intuitive understanding of games to understand it. They propose a theory of gamefulness that splits the concept into more specific constructs, gameful experience, gameful systems, and gameful design. The core focal construct of this theory is gameful experience, which is defined as a psychological state resulting from the interaction of three psychological characteristics: perceiving presented goals to be non-trivial and achievable, being motivated to pursue those goals under arbitrary externally-imposed constraints, and believing that one's actions within these constraints to be volitional. The theory, then, describes the interplay between gameful design, gameful systems and gameful experiences, integrating the psychological research literature on affect, motivation, and other psychological characteristics with the HCI literature.

Finally, Tondello et al. (2018) suggest that researchers have become increasingly interested in understanding how different psychological characteristics may influence how people experience, understand and respond to gamified systems and services. However, there are a dearth of validated measures that we can use to classify game players in meaningful and useful ways. This paper represents an effort to provide empirical validation for the Gamification User Types Hexad scale, which is a self-report questionnaire that assesses and classifies users motivations for engaging in gamified applications. The questionnaire classifies users into a set of “user types,” based on their responses. A large scale study was carried out across two languages, which aimed to establish construct validity for these user types, (i.e., they sought to establish whether there really are distinct types of users of gamified systems), as well as to measure the distribution of players across those user types.

The study provides support for the validity of the questionnaire, which can now be confidently used in the tailoring of gamification experience based on player characteristics.

2.2 Improvements in design practice

One relevant critique of current gamified interventions has been the narrow perspective taken on game design, exploiting only a limited number of design elements, those mostly addressed at obtaining an immediate engagement by eliciting extrinsic motivations and behavioral responses (Rapp, 2017c). Despite the many calls coming from the gamification community (e.g., Jacobs, 2013; Rao, 2013), academic and industry research largely failed to engage in best practice game design processes to produce gamified artifacts. More specifically, the gamification community has largely avoided fully exploring the rich history and practice of game design research, which has assembled an array of evidence on how to create engaging, meaningful experiences through game design (e.g., Rapp, 2017a, 2018a, 2018b).

In this special issue, several articles focus on the search for novel gamified elements, looking at the world of arcade games (Chittaro & Buttussi, 2018) and playground games (Gray et al., 2018), also developing more integrated design strategies rather than exploiting single game elements. Others explore interaction modalities that are still uncommon in gamified application (Xi et al., 2018), or try new approaches of using gamified designs (Ameerbakhsha et al., 2018), by making people observe interaction with them, rather than acting in person, recalling the practice of spectating video games (Sjöblom & Hamari, 2017).

Chittaro & Buttussi (2018), for example, start from the challenge of designing a serious game for mobile devices to support attitude change in aviation safety. They notice that, like gamification systems, serious games are often based on simulations of real-world scenarios that integrate points, badges and leaderboards to reward the user, while different and more complex design elements that make games engaging are rarely used. The authors employ elements coming from the arcade game tradition, such as strict time limits, the avoidance of obstacles and enemies, and a game structure organized around levels of increasing difficulty, to support users in experientially learning how to behave during aircraft evacuations. Two studies find that the game clearly conveys the message concerning what to do in an aircraft emergency, and that it promptly provides feedback about correct and wrong behaviors performed by participants in the game, whereby the fast pace of the game, due to the time limit and the presence of danger and unruly passengers, contributed to these positive results.

BrainQuest (Gray et al., 2018) represents another attempt to move beyond simple and common game elements, drawing inspiration from playground games. The article concerns the design of a game addressed to children, which aims to develop executive function (EF), a key series of interrelated cognitive and self-regulatory skills which are required in nearly every facet of everyday life. BrainQuest is founded upon design principles of fantasy, competence, and relatedness, drawn from Cognitive Evaluation Theory (Deci and Ryan, 1985), and the work of Lepper and Malone (1987), as well as based on and the mechanics of popular playground games. It is about saving and stealing animals in a ‘cattle rustling’ scenario from the Wild West. Users assume one of 3 roles, ‘hero’, ‘cow rustler’, and ‘sheep rustler’, as they play the game together in an outdoor play space. Game activities involve the collection of tangible objects, stealing objects from opponents, and chasing opponents, whereby the physical and digital worlds are bridged by using near-field communication technology. BrainQuest is evaluated in a field study where children used the game in their physical education lessons over a period of 5 weeks. The results suggest that users continued to enjoy playing the game throughout and, therefore, it appears BrainQuest has successfully integrated competence, relatedness and autonomy for the benefit of engagement.

If Chittaro & Buttussi (2018) and Gray et al. (2018) are inspired by the simplicity and immediateness of arcade games and playground games, Featherstone & Habgood (2018) draw inspiration from multiplayer battle games, using Player vs. Environment and Player Matching game mechanics to increase the engagement of undergraduate students with the content and delivery of their course. In UniCraft, the player uses credit earned through engaging with classes, to create a highly customizable avatar that gives the player a unique identity within the game. On the one hand, the system creates a competition to have the most impressive looking avatar that can survive the longest in battle; on the other hand students fight in teams, and even if she is not the team leader, a player can still earn credits by cooperating. A 12-week field study examines students’ long-term engagement with UniCraft finding convincing evidence for the increased motivational power of the battle feature.

Xi et al. (2018), instead, explore design elements that are unique to mobile technology to provide novel gamified interventions. By focusing on two major modalities of mobile gesture technology in the context of gamified mobile marketing, namely surface and motion gestures, the authors aim to facilitate better understanding of their role and their interaction with other gamification design elements, like visual presentation and reward setting, as well as their impact on enjoyment. By conducting three online experiments, the authors find that surface gesture (e.g., touching, scrolling, and swiping) fits better with product picture (vs. symbolic brand logo image) and affects the enjoyment through mental simulation; whereas motion gesture (e.g., shaking, tilting, and rotating) interacts with reward uncertainty (vs. certainty) to impact the enjoyment through perceived control.

Finally, Ameerbakhsha et al. (2018) do not propose novel gamified or serious game elements, but explore a different method of using a serious game within an educational context. The authors create an online game that models how fish populations grow and shrink in the presence of stock removal through fishing. The player has the role of a fishery manager, who sets annual catch quotas, on the basis of the need to maximize profit and not to exceed sustainable limits. Then, through an experimental study, the authors compare the learning effectiveness of two different methods for using the game with two groups of university students, one using free, self-directed exploration of the game, and the other viewing a demonstration of the game being played expertly by the lecturer.

2.3 Providing critical perspectives

The lack of a critical gaze on gamification is apparent in much gamification research. Gamification is commonly considered a technique that is effective and useful in producing positive outcomes on the individual's experience and behavior. Although it is acknowledged that some gamified systems can be designed badly, it is rarely questioned that gamification itself could produce undesirable side effects or undermine desired behavior. In this special issue, the gamification community begins exploring critically the possible negative impacts of gamified design, highlighting that game elements may lead to counterproductive effects (Diefenbach & Müssig, 2018), or harm motivation (Attig & Franke, 2018).

Diefenbach and Müssig (2018) precisely explore the unintended side-effects of gamification designs, tackling the "counterproductive effects of gamification," i.e., cases when a gamification element does not encourage the intended behavior but rather the opposite (e.g., procrastination instead of getting things done). Through a qualitative study based on interpretative phenomenological analysis, and a quantitative field study with 45 users over a two-week usage period, the authors investigate how the gamified task manager Habitica produces counterproductive effects. The authors identify a variety of counterproductive effects like being rewarded for irrelevant tasks or for procrastination. They conclude that counterproductive effects do not represent what was originally intended by the application, and probably do not address the benefits that users originally expected when they started to use the system. Nevertheless, they may play a role in developing motivation of playing, as they can be appropriated by users, as strategies that they develop to make sense of the gamification application. This, nonetheless, may lead to negative side effects. By being carried away by the (counterproductive) effects of gamification, users may lose sight of their original intention, whereby the gamified world may become the focus of attention whereas the effects in the real world become negligible.

Attig and Franke (2018) examine another potential side-effect of gamification designs: the notion that quantified feedback of gamified systems can create a dependency that can harm motivation, which becomes apparent through activity reduction when feedback is not available. The authors hypothesize that activity trackers might elicit a dependency effect, resulting in increased cognitive occupancy by tracker-related thoughts, devaluation of not correctly tracked activities, and decreased motivation for physical activity that manifests on a behavioral and affective level in situations when the tracker is not at hand. Through a scenario- and questionnaire-based survey with 210 users they find that the dependency effect manifests on cognitive, affective, and behavioral levels, and that cognitive and affective outcomes are experienced more frequently than behavioral ones. However, not everyone experiences the effect, and not everyone adapts her behavior without the tracker. Users that use their activity tracker being extrinsically motivated (e.g., to achieve a superior goal) tend to choose the lazier option when the tracker is not available (i.e., to experience a stronger dependency effect). By contrast, users who are physically active because it is fun (i.e., who exercise out of intrinsic motivation) experience the motivational loss to a smaller extent.

3. What's next

While gamification has managed to captivate the imagination and enthusiasm of many, and has led to sudden growth of related literature, there has been a consistent worry among scholars over the lack of theoretical and methodological rigor in the gamification research space (Hamari et al. 2014; Nacke & Deterding 2017). The studies included in this special issue have met this challenge by showing a greater awareness of the theoretical and empirical issues and opportunities when designing gamified systems. Nonetheless, the research on gamification is not yet complete and a variety of questions and room for improvement remain.

Despite the unquestionable progress in the use of theory in gamification research, there is a tendency to use a limited number of theories and constructs to ground gamification designs. SDT is undoubtedly the theoretical framework most referred to in gamification research, and this is reflected in the current special issue. However, the HCI community has shown that to deal with the complexity of the human condition it is often necessary to draw from a variety of theoretical approaches. There is a great deal of relevant accumulated scientific knowledge about human behavior (Tractinsky, 2018), which is scattered across different disciplines. Furthermore, as an interdisciplinary field, HCI has always drawn on research from many scientific fields, including the social sciences (Tractinsky, 2018), and the breadth and depth of knowledge required in such interdisciplinary research cannot be narrowed to a single theory or bunch of theories. After all, disciplines that deal with the "human" often prefer a "pragmatic" approach, precisely to tame this complexity (McCarthy & Wright, 2003). In anthropology, for instance, pragmatism emphasizes that some theories work better than others depending on the particular problem is addressed, suggesting that we should allow our research questions to determine our theories and avoid a sort of theoretical monism. Theory should be referred to for its explanatory usefulness rather than for the authoritative power it might provide (Van Maanen, 2011). This is not to say that gamification should not develop its own concepts and theoretical frameworks. Actually, there is a need to create a common language rigorously defined, on which research can build and accumulate knowledge. Attempts such as those made by Landers, Collmus, and Williams (2018), van Roy, Deterding, and Zaman (2018), and Tondello et al. (2018) should be taken as exemplars. However, a wider use of theories could make gamification studies open to new opportunities for explaining users' behavior, which, in turn, could lead to richer and multifaceted designs.

As for the advancements in design, and the exploration of novel techniques for producing more effective, engaging and enjoyable gamified systems, we observed a positive trend in this special issue. Scholars are increasingly looking at games to draw inspiration for their designs. Yet, there is a variety of opportunities coming from the world of games that are not exploited. For example, there is a range of novel interaction modalities and devices that can be leveraged to gameful aims. Tangible user interfaces are intuitive interaction approaches that allow users to control a game by directly manipulating real objects in hand. Tangible artifacts have been already experimented in game research to increase players' involvement and enjoyment (e.g., Sullivan et al., 2018), but received a minor attention in the gamification domain. Smart tangible toys (Mironcika et al., 2018), for instance, could be used for gamifying serious tasks or supporting change in behavior. Likewise, personal fabrication technologies such as 3D printers could be appropriated within a game frame (Bhaduri et al., 2017) to create novel gamified activities (Rapp et al., 2017). Further, wearable technologies are starting being used in game research, for example to increase the immersiveness and player/character relationship (Buruk & Özcan, 2018), and could be inspiring for gamification ends as well. As most of the gamified systems developed until now remain enclosed in a digital environment, these approaches tell us that we can move to the physical world paying more attention to both the physicality of the device and the interaction opportunities opened by it. A wider and deeper exploration of natural and gestural interfaces, involving for example full-body interaction, goes in the same vein, whereby game research has been experimenting with a variety of solutions for a long time (Mueller et al., 2018).

Much progress can also be made in improving the documentation of, and critical engagement with, design practice in the gamification design process. The move towards "Research through Design" (Zimmerman, Forlizzi & Evenson, 2008) in HCI has had little evidential impact upon the way in which gamification research is carried out and reported. If one of the most pressing question we should ask ourselves when assessing a gamified system is "where is the game?," which means to question whether the system is really

producing an enjoyable and engaging experience or rather is only implementing a void game shell, we need to look at the full range of design studies to find insights on how we can make our designs more “gameful.”

Finally, an ethical reflection on the use of gamification design is still underdeveloped. The potential gamified dystopia foreseen by Jesse Schell in the talk “Design outside the box” given at DICE 2010 has not yielded the development of an ethical debate about the potential negative systemic side-effects of a massive use of games to motivate people and change their behavior. A recent episode of the Black Mirror series, “Nosedive,” which depicts a future when people are continuously assessed and rewarded for their pro-social behavior within a pervasive gamified system, focuses again the need to think of the long-term impacts of gamifications on individuals and society. The possibilities of tying gamification techniques to self-tracking technologies and personal data, for example, open a variety of opportunities as well as potential threads. The many “social credit” initiatives that are starting in China, for example, envelop individuals in a feedback loop in which everyday behaviors are constantly assessed and “rewarded” or “punished.” This does not have much to do with a game, rather with a behavioral experiment that exploits some elements of games to motivate people behave in certain “desirable” ways (Linehan, Kirman & Roche, 2015).

Discussing gamification only with reference to its effectiveness, usefulness, and capability of changing behavior seems not to be sufficient. Likewise, there could be cases in which making an experience more enjoyable and engaging could not be a valuable outcome, or changing behavior by exploiting “gameful” reinforces could be questionable (Rapp et al., 2016a). Are there domains in which gamification should not be employed? What are the impacts that a pervasive gamification design could produce on the individual and society? What if our whole life will be turned into a game? What if novel, extremely effective, immersive, and pleasurable game elements will be successfully employed to change behavior? Is gamification implicitly reinforcing some aspects of our society? These questions did not receive an answer in the articles published in this special issue, and we think that the gamification community should start exploring them in the next years.

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