Impacts of gamification on intrinsic motivation

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ABSTRACT

Gamification, commonly defined as "the use of game elements in non-game contexts" (Deterding, Dixon, Khaled & Nacke, 2011), continues to be a topic of interest within the field of user experience (UX) design. The purpose of gamification is usually to increase user engagement, and as a method it seeks to accomplish this through gameful experiences that afford intrinsic motivation in users. However, gamification in practice has thus far been characterized by an emphasis on implementing reward systems commonly found in games through elements such as points, badges and leaderboards (Hamari, Koivisto & Sarsa 2014, Seaborn & Fels 2015). Studies have shown that tangible rewards significantly undermine intrinsic motivation (Deci, Koestner & Ryan, 1999), and this could potentially mean that the reward systems featured in many gamified products and services may in fact harm intrinsic motivation, not enhance it. This literature review aims to assess whether the use of gamification is likely to facilitate or undermine intrinsic motivation, and presents a summary of self-determination theory (Ryan & Deci, 2000), as well as relevant results from empirical studies on the relations between gamification, performance and motivation. All in all, gamification has been shown able to both facilitate and undermine intrinsic motivation through supporting or thwarting the basic psychological needs for autonomy and competence (Ryan & Deci, 2000). This indicates that the effect of motivational affordances is significantly dependent on individual and contextual factors. More research is needed to better describe the factors that affect user motivation in gamified contexts, especially regarding different types of rewards.

KEYWORDS: Gamification, Motivation, Intrinsic motivation, Self-determination theory

1. INTRODUCTION

In recent years, user experience (UX) designers have shown great interest in applying elements of game design within other contexts in order to create enjoyable experiences and increase user engagement. This practice is commonly referred to as gamification (Deterding et al., 2011), and proponents of gamification claim that it is highly effective in promoting user engagement through increased user motivation. As games are purpose-built to afford motivation and enjoyment, surely any activity could be made more enjoyable by implementing game elements, it is reasoned (McGonigal, 2011). Yet others claim that gamification is simply a marketing rhetoric exploiting the financial success of the game industry (Bogost, 2011), and worry that its implementation could have a negative long-term impact on users (Nicholson, 2012). To determine whether gamification is in fact a useful concept within the field of UX design, one needs to understand how gamification affects user motivation, and whether its implementation reliably leads to increased user engagement.

Gamification is sometimes defined as "a process of enhancing a service with (motivational) affordances for gameful experiences in order to support user's overall value creation" (Huotari & Hamari, 2012). This definition reflects the widely held belief that the goal of gamification is to influence user behavior through user motivation, and that this motivation in turn can be positively influenced by the motivational affordances commonly found in games. Notably, the desired user behaviors are considered to emerge specifically from *intrinsically* motivating experiences (Hamari et al. 2014, Nicholson 2012). Intrinsic motivation, which is defined as the doing of an activity for its inherent satisfactions rather than for some separable consequence (Ryan & Deci, 2000) is believed to be crucial for the experienced enjoyment of a task. As the goal of gamification is to modify regular human-machine interactions and turn them into more engaging and motivating ones (Marache-Francisco & Brangier, 2015), it is mainly intrinsic motivation which gamification seeks to increase.

However, gamification in practice has thus far been characterized by an emphasis on implementing reward and feedback systems commonly found in games, such as points, badges and leaderboards. (Hamari et. al, 2014, Seaborn & Fels 2015) Studies have shown that tangible rewards significantly undermine intrinsic motivation (Deci et al., 1999), and this could potentially mean that the reward systems featured in many gamified products and services may in fact harm intrinsic motivation, not enhance it. This apparent conflict between the expressed purpose of gamification and the way it is commonly implemented could be a reason gamification fails in practice, and so it needs to be clearly addressed.

This paper aims to present an overview of the relevant information pertaining to this issue, and to assess whether the use of gamification is likely to facilitate or undermine intrinsic motivation. First, there will be a summary of self-determination theory (SDT), a motivational theory that is considered fundamental to understanding how gamification is affecting intrinsic motivation both in theory and in practice. Secondly, an overview will be given of relevant results from empirical studies on the relations between gamification, performance and motivation. Lastly, these results will be discussed considering the problem at hand, and topics for further research will be suggested.

2. METHOD

Relevant literature was found through searches in the Scopus database as well as in Google Scholar. Literature considered relevant included scientific papers pertaining to:

- Definitions of gamification, the purpose of gamification, common game elements/motivational affordances used in gamification.
- Self-determination theory, definitions of different types of motivation, and how to increase or decrease intrinsic motivation.
- How gamification affects user engagement and performance.
- How gamification affects intrinsic motivation and/or extrinsic motivation.

With a few exceptions, the selected papers on the subject of gamification were written as recently as 2013 or later, as these were considered more reliable than papers written around the time of the most intense popularization of gamification (ca. 2010). Papers on motivational psychology, however, were selected based on their importance to the topic at hand, regardless of the year they were published.

3. AN OVERVIEW OF SELF-DETERMINATION THEORY

Even though much of the theoretical foundations of gamification are yet not well-defined, the concept of motivation as seen in self-determination theory (SDT) is considered to be a well-established foundation (Deterding 2015, Seaborn & Fels 2015). SDT differentiates between two main types of motivation; intrinsic and extrinsic. Intrinsic motivation refers to pursuing an

activity because it is inherently interesting or enjoyable, while extrinsic motivation refers to doing something because it leads to a separable outcome (Ryan & Deci, 2000). Below is a summary of the most essential ideas connected to intrinsic and extrinsic motivation as seen within self-determination theory and its subtheories.

3.1 Intrinsic motivation

When intrinsically motivated, a person is moved to act for the fun or challenge entailed rather than because of external pressures or rewards. Intrinsic motivation is a natural inclination towards exploration, mastery and spontaneous interest that benefits persistence, performance and well-being (Ryan & Deci, 2000, Deci et al., 1999). In SDT, intrinsic motivation is seen as an inherent tendency in humans, and will flourish if conditions allow it. Cognitive Evaluation Theory, a subtheory of self-determination theory, argues that in order to facilitate intrinsic motivation, conditions have to support the fundamental psychological needs for competence and autonomy (Ryan & Deci, 2000).

Competence is the perceived extent of one's own actions as the cause of desired consequences in one's own environment (Ryan & Deci, 2000), and thrives when met with direct and positive feedback. Yet people must not only experience perceived competence, they must also experience their behavior to be self-determined if intrinsic motivation is to be maintained or enhanced. This means that feelings of competence will not increase intrinsic motivation unless they are accompanied by a sense of autonomy (Ryan & Deci, 2000). There are additional needs that can be supported to further help facilitate intrinsic motivation, like relatedness and curiosity, but competence and autonomy are regarded as the most essential.

Feelings of competence and autonomy can be supported through contextual conditions such as positive performance feedback, and the opportunity for choice and self-direction. Support can also to some extent come from individual's

abiding inner resources (their ongoing feelings of autonomy and competence). Unfortunately, the need for autonomy and competence can also easily be thwarted by contextual conditions such as threats, deadlines, competition pressure and imposed goals (Ryan & Deci, 2000). Most notably, the need for autonomy has been shown to be reliably diminished by expected tangible rewards made contingent on task performance (Deci et al., 1999). This piece of knowledge has its origin in a much-quoted meta-analytic review from 1999, in which Deci et al. reviewed experiments that examined the effects of extrinsic rewards on intrinsic motivation. They found that "engagement-contingent, completion-contingent, and performance-contingent rewards significantly undermined free-choice intrinsic motivation, as did all rewards, all tangible rewards, and all expected rewards. Engagement-contingent and completion-contingent rewards also significantly undermined self-reported interest, as did all tangible rewards and all expected rewards. Positive feedback enhanced both free-choice behavior and self-reported interest".

In short, they found that tangible rewards reliably undermined intrinsic motivation for interesting activities, even when tangible rewards were offered as indicators of good performance. However, this was not the case when the rewards were unexpected and/or not contingent on task performance. In such cases, intrinsic motivation was unaffected. The only type of "reward" found to increase intrinsic motivation was verbal positive feedback. (Deci et al., 1999)

Another subtheory of SDT called Causality Orientation Theory argues that feedback can thwart or support need satisfaction for autonomy dependent on an individual's causality orientation. It is shown that people differ in the extent to which they experience their actions as self-determined, and this influence whether they perceive feedback as informational or controlling. Therefore, if an individual is Control Oriented, even positive feedback can end up being experienced as controlling, thus thwarting the
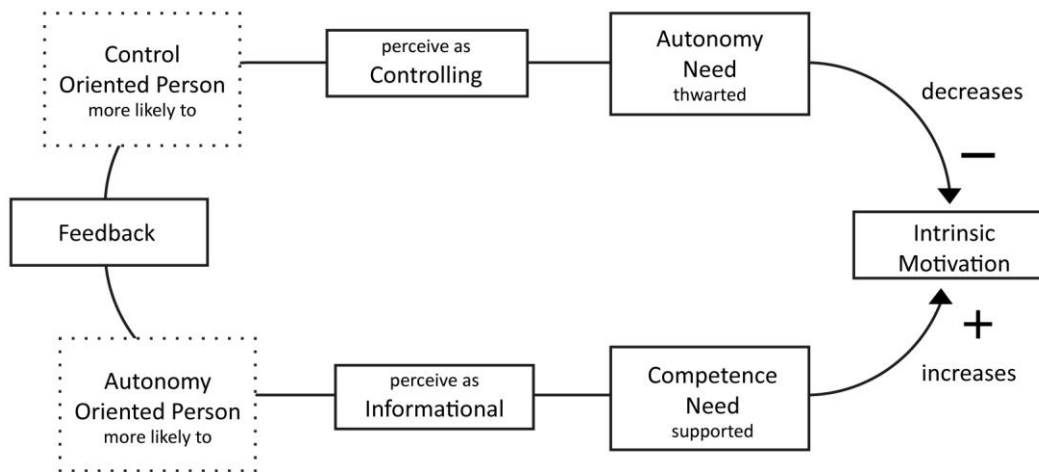
Figure 1: Controlling vs informational feedback depending on causality orientation (Mekler et al., 2017)

need for autonomy instead of supporting the need for competence (see Figure 1)

To summarize, Ryan and Deci has found that conditions supportive of autonomy and competence reliably facilitates intrinsic motivation, whereas conditions that control behavior undermines its expression (Ryan & Deci, 2000). To increase intrinsic motivation, one has to avoid the undermining of these fundamental needs.

3.2 Extrinsic motivation

While the aim of gamification is to help facilitate intrinsic motivation, it should be noted that most of the activities people perform are not, strictly speaking, intrinsically motivated (Ryan & Deci, 2000). Most activities are at least partially motivated by some factor external to the action itself, and all such forms of motivation are collected under the term extrinsic motivation. Extrinsic motivation is often associated with being facilitated mainly by the desire to acquire rewards and avoid punishments, and this is seen as less ideal regarding people's experienced well-being than intrinsic motivation. Yet, while perhaps not as ideal as intrinsic motivation, SDT proposes that

extrinsic motivation can vary greatly in the degree to which it is autonomous, and the more autonomous forms of extrinsic motivation can also lead to greater experienced well-being as well as increased performance (Ryan & Deci, 2000).

Within SDT a subtheory, referred to as Organismic Integration Theory, was introduced to detail the different forms of extrinsic motivation and the contextual factors that either promote or hinder internalization and integration of the regulation for these behaviors (Ryan & Deci 2000, Vansteenkiste 2010). (See figure 2) The more internalized and integrated the extrinsic motivation is, the more likely it is that an individual will experience the motivation as internally caused, and thus as being more autonomous and self-determined. For example, a student who does their homework in fear of parental punishment is extrinsically motivated out of compliance with an external behavioral regulation. Similarly, a student who does their homework because they see it as valuable for their chosen career is also extrinsically motivated, yet this student will experience a greater feeling of self-determinedness. In the latter student, the extrinsic motivation for doing homework has been internalized and integrated into their goals and
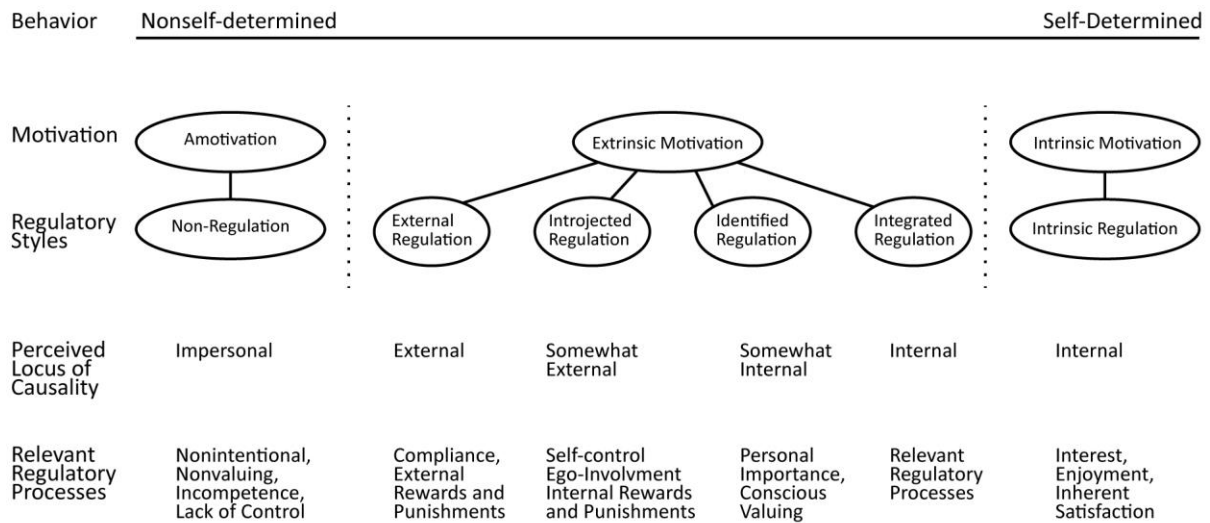
Figure 2: A taxonomy of human motivation (Ryan & Deci, 2000)

identity, and thus they are regulating their own behavior. This form of extrinsic motivation is much more likely to increase the student's experienced well-being (Ryan & Deci, 2000).

Like with intrinsic motivation, contexts supportive of autonomy and competence has been found to foster greater internalization and integration of regulatory behaviors than contexts that thwart satisfaction of these needs (Ryan & Deci, 2000). This implies that supporting the needs for autonomy and competence is important for facilitating internalized forms of extrinsic motivation as well as intrinsic motivation.

In summary, according to SDT the issue with extrinsic rewards is that they can undermine people's taking responsibility for motivating or regulating themselves, thus negatively affecting their perceived autonomy. Contextual conditions that support one's feelings of competence and autonomy are the basis both for maintaining intrinsic motivation and for becoming more self-determined with respect to extrinsic motivation (Ryan & Deci, 2000). It should however be noted that when Deci et al. refer to extrinsic rewards in their 1999 review, they are referring specifically to tangible rewards that are expected and/or contingent on task performance. Additionally, positive feedback can enhance intrinsic motivation, but not when it is perceived as controlling rather than informational.

4. RESULTS FROM STUDIES ON THE EFFECTS OF GAMIFICATION

Scientific studies on the effects of gamification have been reviewed and summarized in literature reviews by Hamari et al. (2014) and Seaborn and Fels (2015). In this section, relevant conclusions from these reviews are compared and summarized. Additionally, some interesting findings from more recent studies are also noted.

4.1 How gamification affects performance

In both literature reviews mentioned above (Hamari et al. 2014, Seaborn & Fels 2015), the authors conclude that gamification in general seems to provide somewhat positive effects on user performance. However, they also in both cases point out several shortcomings in the research done so far, and state that more well-designed empirical studies are needed to validate and understand the concept of gamification in

theory and practice. So, while it has been shown that performance can be increased through gamification, it is hard to determine answers from existing research as to why this increase in performance occurs in some cases and how to reliably facilitate this effect. Still, there are interesting points to be made from the findings in the reviews.

First, it should be noted that the effect of gamification on user performance seems to be very much dependent on both contextual factors and the personalities of the users. In both literature reviews, they found that most of the examined studies took place within the domain of education, with much fewer studies done in other domains, and that results differed significantly between these. Seaborn and Fels (2015) note that "Similar implementations of gamification in different domains did not necessarily impact participants in the same way". The also refer to studies showing that age and familiarity with gaming were factors that contributed to interest and use. Hamari et al. (2014) point out that the context of a gamified system may play an important role in how the user is affected by said system. Amongst other things, they recommend considering the voluntariness of carrying out a system task in a given context. The presence or lack of voluntariness affects a user's feelings of autonomy and therefore also their motivation towards performing said task. They further state that user qualities would influence attitudes towards gamification, as well as on how people interact with and are affected by the gamified system.

Additionally, it is noteworthy that many of the reviewed studies focused their attention on the effects of implementing badges, points and leaderboards. Results from these studies were mixed, and the same game elements invoked either both positive and negative or neutral effects in different aspects of user performance. From the results overall, these game elements do seem somewhat successful in increasing performance, though not always in predictable ways. Hamari et al. (2014) note that the same

aspects of a system that were liked by some users were most often also disliked by others. Therefore, the qualities and personalities of users again are seen to play a role.

Another noteworthy factor is that almost none of the reviewed studies were conducted over long periods of time. Seaborn and Fels (2015) express concern that the novelty factor of gamification may induce early positive results that would decrease over time. One notable exception is a study conducted by Hamari (2013) which collected a year's worth of data on user activity after badges had been implemented into a web service. The results showed that "mere implementation of gamification mechanisms does not automatically lead to significant increases in use activity in the studied utilitarian service, however, those users who actively monitored their own badges and those of others in the study showed increased user activity." (Hamari, 2013)

In summary, gamification appears to have somewhat positive effects on user performance and engagement, though this is greatly dependent on context and user qualities. That gamification is able to increase performance indicates that it does affect the motivation of users, but whether it increases intrinsic or extrinsic motivation, and whether the shown effects on motivation and performance would last over time is as yet unclear.

4.2 How gamification affects motivation

In their comprehensive review of gamification literature Seaborn and Fels (2015) identified intrinsic and extrinsic motivation as some of the most frequently discussed yet rarely empirically studied constructs in gamification research. As intrinsic motivation is a psychological outcome and cannot be inferred from performance gains in itself, this means that while gamification can be said to somewhat reliably increase performance, there is little evidence supporting any claims to how it affects intrinsic motivation.

One recent notable study by Mekler et al. (2017) did investigate the effects of individual game elements on user's motivation. They tested the effect of points, levels and leaderboards on intrinsic motivation while taking user's causality orientation into account, and found that "game elements did not significantly affect competence or intrinsic motivation, irrespective of participants' causality orientation" (Mekler et al., 2017). However, implementation of these game elements significantly increased performance. As the elements did not affect perceived autonomy, competence, or intrinsic motivation, they conclude that "points, levels and leaderboards functioned as extrinsic incentives, effective only for promoting performance quantity".

Another study by Hanus and Fox (2015) showed mostly negative results from gamifying an educational course. The study involved two courses, of which one course received a gamified curriculum, featuring a leaderboard and badges, whereas the other course received the same curriculum without the game elements. Their results found that "students in the gamified course showed less motivation, satisfaction, and empowerment over time than those in the non-gamified class." They believe this to be due to the decremental effect of tangible rewards on intrinsic motivation as described in SDT, and note that "this suggests that some care should be taken when applying certain gamification mechanics to educational settings."

Yet a study by Lieberoth (2015) yielded slightly positive results when testing the effect of framing an activity as a game. The activity in question was collectively giving and rating input in response to survey questions. He tested different versions of this activity, one featuring game mechanics, one that simply framed the activity as a game and a control that did neither. In both game conditions, interest and enjoyment were significantly superior to the control scenario, which implies increased intrinsic motivation. Other intrinsic motivation variables remained unchanged, however. From this, Lieberoth concludes that "the results demonstrate that the effects of simply framing the activity as a game though vernacular and artifacts holds almost as much psychological power as the full game mechanics."

All in all, the little existing research that has been done on the impacts of gamification on intrinsic motivation is not conclusive. As can be seen from the above examples, such studies vary in their setting, criteria, goal and execution and yield very different results. Currently, it is largely unknown how gamification does affect intrinsic motivation in practice, and thus why results differ so significantly from experiment to experiment.

5. DISCUSSION

When combining the theory of self-determination theory (SDT) with the results of studies on the effects of gamification, the findings above show that gamification is capable of both facilitating and undermining intrinsic motivation. According to SDT, gamification should be capable of increasing intrinsic motivation through supporting the basic psychological needs for autonomy and competence. However, whether it does so is dependent on the motivational affordances of the gamified system as a whole in relation to the users of the system and the context that is gamified. For example, feedback that is supposed to afford for increased feelings of competence can be perceived as controlling by some users and thus instead diminish their perceived autonomy (Ryan & Deci, 2000). In practice, gamification has been shown capable of increasing user performance and engagement (Hamari et al. 2014, Seaborn & Fels 2015), which indicates increased motivation. Yet it is not clear what types of motivation are affected, or to what degree the engagement persists over longer periods of time. Meanwhile, studies on the effects of gamification on intrinsic motivation feature both neutral, positive and negative results (Mekler et al. 2017, Hanus & Fox 2015, Lieberoth 2015). This shows that gamification can affect intrinsic motivation in varied ways depending on implementation and contextual factors.

While there is no clear conclusion as to the question of whether the use of gamification is most likely to facilitate or undermine intrinsic motivation, there are some factors regarding the question itself that needs to be addressed. The following sections will therefore discuss whether the use of rewards in gamification is as worrying as it seems (section 5.1), as well as whether disregarding any type of motivation but intrinsic is necessary when considering gamification's purpose (section 5.2). Finally, opportunities and measures for further research will be discussed in section 5.3.

5.1 Comparing tangible and intangible rewards

The worry that the reward systems commonly included in gamified applications would inherently undermine intrinsic motivation has been brought up by numerous authors, including Hamari et al. (2014), Nicholson (2012) and Marache-Francisco & Brangiers (2013) amongst others. For example, Hamari et al. (2014) state in their literature review of gamification studies that "outside pressures (such as extrinsic rewards) undermine intrinsic motivations and hence would in essence undermine gamification, which is an attempt to afford for the emergence of intrinsic motivations" (p. 3030). They, and the other authors who echo this sentiment, refer to the meta-analysis by Deci et al. (1999) of studies that examined motivation in educational settings, in which they found that almost all forms of tangible rewards (except for unexpected rewards and task-noncontingent rewards) reduced intrinsic motivation. The implication of this is taken to be that once gamification is used to provide extrinsic motivation, the user's intrinsic motivation decreases.

While this is a valid concern, it should be noted that the most common elements of gamification reward systems, like points, badges, leaderboard positions and levels (Hamari et al. 2014, Seaborn & Fels 2015) are quite different from the tangible rewards that were examined in that much-quoted meta-analysis. Indeed, Deci et. al (1999) showed that tangible rewards "ranging from dollar bills to

marshmallows" undermine intrinsic motivation, but to what extent does the intangible rewards of gamification do the same? After all, when rewards like points and badges are used in the context of gamification, they often do not have any value outside the gamified system. Of course, there exist systems in which users are rewarded for their activities in a system with money, food or products. And in other cases, it can be argued that they gain some social status from their collected intangible rewards. Yet intangible rewards often only carry value to the individual user, and only within the context of the gamified system. And this kind of usage of intangible rewards is arguably one of the most common aspects used to gamify a system.

In such cases, when the rewards of a gamified system are largely in the form of intangible rewards, it cannot be assumed that they will have the same effect on user motivation as a system that relies on tangible rewards. After all, positive feedback is one such intangible reward which has been shown to facilitate intrinsic motivation instead of undermining it. In this sense, it is likely that some intangible reward systems can be perceived as feedback systems by autonomy oriented users, thus facilitating for increased intrinsic motivation. Arguably, most intangible rewards can stimulate intrinsic motivation, as long as they support a user's need for competence without being experienced as controlling.

In summary, the worry that gamification might inherently undermine intrinsic motivation is valid, but the way the problem is stated does not take into account the full picture of rewards as seen in gamification practice. The findings of Deci et al. (1999) about how tangible rewards negatively affect intrinsic motivation are indeed important in understanding how gamification can undermine intrinsic motivation. But more research is needed to know with any certainty whether gamification that uses mainly intangible rewards or a combination of tangible and intangible rewards are as problematic regarding intrinsic motivation as simply relying on tangible rewards alone.

5.2 Extrinsic and intrinsic motivation are not necessarily antagonistic

Many papers on gamification that discuss the desired impact of gamification on motivation frame extrinsic motivation as something to be avoided in favour of intrinsic motivation (Hamari & Koivisto 2012, Nicholson 2012, Marache-Francisco & Brangiers 2015). It seems to be taken for granted that gamification should seek to increase intrinsic motivation, while disregarding extrinsic motivation as something entirely undesirable. The reason for this attitude might be that while it is known that both extrinsic and intrinsic motivation promote performance gains (Cerasoli et al., 2014), "only intrinsic motivation has been associated with improved psychological well-being, enhanced creativity and learning outcomes, as well as increases in the extent and quality of effort that people put into a given task" (Mekler et al., 2017).This association of intrinsic motivation with well-being and quality of user engagement seems to be what makes it appealing to designers and researchers.

What tends to be forgotten is that the more internalized types of extrinsic motivation can also facilitate increased well-being and engagement, according to the organismic integration subtheory of self-determination theory (Ryan & Deci, 2000). This means that internalized extrinsic motivation could also be used as a means to influence user behavior and boost performance without negatively impacting user well-being. When considering that many gamified systems are made with the intent of supporting a user in achieving a goal, such as becoming healthier or learning a new skill (Seaborn & Fels, 2015), this insight becomes especially relevant. The initial goal of the user is often extrinsic to the activities in gamified system itself, and thus extrinsic motivation is what initially makes the users choose to engage with the system. Maintaining this inherently extrinsic but often internalized motivation could potentially be essential to user retention, and as such extrinsic motivation should not be so easily dismissed as undesirable in gamification theory.

In summary, extrinsic and intrinsic motivation are not necessarily antagonistic, and should be considered simultaneously (Cerasoli et al., 2014). While it is not desirable to rely on external extrinsic motivation (f.ex. in the form of tangible rewards and punishments), internal extrinsic motivation (f.ex. in the form of personal goals) is not considered harmful to user well-being and should be supported by a gamified system. Supporting the basic psychological needs for autonomy and competence will help facilitate both increased intrinsic motivation and internalized extrinsic motivation (Ryan & Deci, 2000).

5.3 Implications for further research

It is not only important to know whether gamification as a design approach can produce the intended changes in user performance, but also to know the motivations behind why these changes occur. As of now, the research on the effect of gamification on intrinsic motivation is inconclusive, even if the theoretical foundations are well-established (Seaborn & Fels, 2015). Until more studies are done, there is no proof that gamification can reliably increase intrinsic motivation, or that it inherently undermines it. The results of this literature review have shown that the effects of gamification are very context dependent. Whether a given game element is perceived as extrinsically or intrinsically motivating depends on individual and contextual factors (Deci et al., 1999). Indeed, Deterding (2014) proposes that a given element may be both intrinsically and extrinsically motivating for certain people in certain situations at certain times. Further studies on this topic should therefore attempt to determine contextual factors that could be affecting their results, ranging from psychological factors like user's causality orientation to environmental factors like where and when the gamified system is used. Notably, one could examine whether such factors affect whether intangible rewards are perceived as extrinsic or intrinsic.

Furthermore, the experiments done so far have often focused on testing the effects of implementing individual reward elements like points, badges and leaderboards (Hamari 2013, Mekler et al. 2017). It should not be forgotten that this is a very narrow range of game elements, and that using them individually does not show the potential effects of a more complex gamified system. As Deterding (2014) describes in his critique of common gamification practices, the motivational effect of a gamified system is an emergent property arising from the system as a whole. No one game element will be responsible for motivating users, it is rather the entire gameful experience afforded by the system. Therefore, it is recommended to test more complex motivational systems of interrelated game elements if one is to determine what effects gamification can have on user motivation.

Additionally, it is worth noting that, as Lieberoth (2015) showed, framing an activity as a game can be as effective as applying game mechanics to it. This suggests that the aesthetic elements of game design could play an important part in facilitating user motivation, and should be given more attention. Indeed, aesthetic elements are considered one of the main types of game elements by Schell (2008), together with mechanics, story and technology. Examining the effects of aesthetic elements in themselves could be important in understanding how to create more gameful experiences in a non-game context. In the same line of reasoning, it would be interesting to see whether story elements could have positive effects in gamified systems, either by making story progression into a form of intangible reward, or by employing storytelling as a means to further frame activities as game-like.

Lastly, one of the most significant unknown factors in understanding how gamification affects user motivation is the factor of time. As many gamified systems seek to change user habits (Seaborn & Fels, 2015), they need to be engaged with over long periods of time in order to have the desired effect. However, little research has been done on the effects of gamification over longer periods of time, and as such the shown positive or negative effects may be due to the novelty or newness of using such a gamified system. Longer tudies should therefore be conducted to see to what extent the impacts on motivation are caused by this newness factor. Another way to assess the effects of gamified elements on motivation while negating the newness factor could potentially be to remove game elements from already established gamified systems, and see how this changes user motivation.

6. CONCLUSIONS

In conclusion, gamification has been shown able to both facilitate and undermine intrinsic through supporting the basic psychological needs for autonomy and competence, by for instance providing users with meaningful choices and optimal challenges (Ryan & Deci, 2000). However, the effect of such means is significantly dependent on individual and contextual factors, like a user's age, personality and experience with games or whether the use of the gamified system is voluntary or not. More research is needed to better describe the factors that affect user motivation in gamified contexts, especially over longer periods of time. Tangible rewards have been shown to undermine intrinsic motivation (Deci et al., 1999), yet the use of intangible rewards could potentially facilitate intrinsic motivation if a user is likely to perceive such feedback as informational rather than controlling. Additionally, it may be most effective to design motivational affordances for both intrinsic motivation and the more internalized types of extrinsic motivation if one wishes to keep users engaged (Cerasoli et al., 2014).

All in all, the findings of this review suggest that for gamification to be a useful concept within the field of UX design, it must be regarded as tool for creating custom motivational experiences for different users and contexts, not as a catch-all solution to a general lack of user motivation. Just as games are not all about rewards, but also about goals, challenges, stories and the experiences that arise from these, so gamification should be about

more than implementing a handful of reward elements. Without a meaningful emergent experience that enables game elements like points and badges to support a sense of competence and autonomy in users, such elements will not be motivating, and this is important to consider when one wishes to implement gamification with user's well-being in mind.

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