

Context in Gamification

Contextual Factors and Successful Gamification

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ABSTRACT

In order to design a good product, thorough research is required. This is equally true in the design of a gamified service. Contextual factors have been highlighted as potentially important factors a designer should take into consideration in relation to a context - or domain, with examples of such domains being education, health and business. However, as current research on how a consideration of context may affect the outcome of gamification in terms of effectiveness is lacking, this review paper will attempt to bring further insight on the topic and present an overview of contextual factors with their associated domains.

KEYWORDS: Gamification; context; contextual factors; contextual relevance; design.

1. INTRODUCTION

In light of the increasing popularity of games, there has been a surge of products that aim to implement gamification, which is a concept inspired by video games. Gamification is frequently cited as “the use of game design elements in a non-game context” (Deterding, Dixon, Khaled, & Nacke, 2011, p. 9), and the topic gained increased popularity around 2010 with the peak of the hype being in early 2014 (“Google Trends,” n.d.). Gamification has been applied to many fields, such as the health industry to change unhealthy behaviour, in education to improve learning and in the workplace with an aim to improve performance of employees.

Furthermore, gamification is a sore topic with conflicting views. One of gamification’s biggest opponents is Ian Bogost. Bogost states how gamification is no more than an invention created to ‘capture the wild, coveted beast that is videogames and to domesticate it for use in

the grey, hopeless wasteland of big business’ (Bogost, 2011). He even goes as far as proposing the term ‘exploitationware’ for it. Others point out the problem regarding what is often referred to as ‘pointsification’, in lieu of proper gamification, explained as “taking the thing that is least essential to games [like points, badges and leaderboards] and representing [them] as the core of the experience” (Robertson, 2010). Simply adding game mechanics to an already existing product is often sold off as an easy gamification solution (“What Is Gamification?”, 2011), when in reality thorough research into user needs and limitations and designing a solution that fits those correspondingly should be conducted (Deterding, 2015). Nevertheless, sources that present supportive views on gamification exist. For instance, in an extensive literature review by Hamari et al. (2014), the authors observe that their review indeed indicates that gamification affords positive effects. However, they also mention how it seems that the context of deployment in

particular, or application domain, of a gamified service, as well as its users, might greatly affect whether or not gamification will render the desired positive effects, and as such be deemed effective. Richards et al. goes as far as calling the understanding of context of deployment the third important pillar of design, with considering user engagement and the entertainment value of the system as the first two (2014, p. 224). Effectiveness in the context of this article is thought of as degree of successfulness, where successfulness refers to how well the intended goals for a gamified solution are met while supporting users' needs.

When implementing gamification, the goal is often to change a user's behaviour, increase motivation and performance as well as improve user engagement (Hamari et al., 2014). How could the successfulness of a gamified solution be affected by factors that derive from the context of deployment? Throughout the article, these factors will be referred to as 'contextual factors', where context refers to the domain into which a service is deployed, including factors that derive from the environment itself, individual differences and the nature of the system.

Several other articles and literature reviews and articles on gamification also identifies an arising need for more research on the impact of context, or situation, on the outcome of gamification (Buckley & Doyle, 2017; Marache-Francisco & Brangier, 2013; Nicholson, 2012; Richards et al., 2014; Seaborn & Fels, 2015). Some mention this need explicitly under their proposals for further work. Others point out that the reasons for why some studies on the effect of gamification gave mixed results appeared to be context-specific, observing how 'gamification in different domains did not necessary impact participants in the same way' (Nicholson, 2012).

As research is lacking, writing a review paper about contextual factors related to the successfulness of gamification is consequently a bit tricky. However, mapping out and sorting contextual factors that should be taken into

consideration is an alternative route. Choosing game elements, mechanics, goals and dynamics that support one another should derive from the research phase of a design process (Deterding, 2015), and a part of this first phase should assumingly be the identification of contextual factors. Therefore, a clearer overview of contextual factors could be a useful tool for designers if given the task to design a gamified service.

A lot less attention has been given to the context of deployment compared to how a system could be fun and engaging (Richards et al., 2014). Considering contextual relevance when one wants to design a gamified product seems important to achieve a successful application of gamification, and should consequently get more focus. The aim for this review article is therefore to attempt to find specific factors mentioned by different papers that seem to have particular importance on the outcome of gamification within a given domain, and, to a certain degree, create an overview of them.

2. METHODS FOR RESEARCH

Through a review of articles exploring gamified products within different contexts, what seemed like could be contextual factors were attempted to be distilled from the papers' findings and paired up with their respective domain. The articles were collected in the following manner:

1. In Hamari et al.'s literature review (2014), a suggested topic for further research was that of context, as it has presented itself as important for effective gamification. Furthermore, they mentioned how an understanding of contextual factors could be beneficial for further research on the topic.
2. Next, the paper's references - connected to the research on the impact of context - were extracted from the texts and literature lists.
3. Other literature reviews on gamification were found. Many also mentioned the need to study the relationship between context

and effectiveness, leading to the choosing of this topic for this review paper.

4. Further database research on the subject was then done:
 - a. Databases used: Scopus and Google Scholar (redirects to other databases).
 - b. Search terms: gamification, gamification and context/ contextual factors, gamification and effectiveness /efficiency, user performance, situational relevance.
 - I. Limitations to the database search: Most of the search words were situated to the term 'gamification', rather than alternative ones, as 'gamification' is most known and frequently used. There could be other relevant areas that discuss contextual factors that will not be included here, as other papers might use other names than 'gamification'.
 - c. Focused search:
 - I. Abstracts from articles that seem to discuss gamification and gamification within a given domain were read, based on titles. Articles that have studied aspects of what this research paper wishes to address were chosen.
 - II. Studies on gamification rather than games.
 - d. Remaining literature was found through the literature reviews' reference lists.
5. Finally, the findings from the resulting articles were analysed and presented here under the results and discussion.

Additionally, Seaborn and Fels (2015) point out that pointsification is the most common gamification strategy, so studies on other strategies for gamification are few.

3. RESULTS

Studies have looked at different gamified products in different domains, such as education (Buckley & Doyle, 2017), business and commerce and health, while also discussing the importance of not neglecting situational relevance (Nicholson, 2012) or a product's context of deployment (Richards et al., 2014). Although there is an interest for gamification in many applications, most gamification research is focused on the domains of education (primarily), health and wellness, online communities, crowdsourcing and sustainability (Seaborn & Fels, 2015). These domains will therefore be the prioritized domains for this research paper.

To recap, contextual factors are factors that derive from a gamification system's context of deployment, or 'application domain' (Seaborn & Fels, 2015, p. 20). That is, the domain within which the gamified system has been applied. Furthermore, Hamari et al. (2014) suggest that understanding and finding contextual factors, could benefit from looking at the following three perspectives:

1. The social environment
2. The nature of the system
3. The involvement of the user

It is likely that there exist confounding factors; known or unknown factors that might affect an outcome (Hem, 2013). On the topic of gamification, consider the following example: Do badges (factor A) lead to an increase in user performance (factor B)? Perhaps for some users, but studies suggest there are other confounding factors involved, such as a player type (Dam, Herger, & Kumar, 2017) or personality (Buckley & Doyle, 2017) (factor C) that could be the real explanation. In terms of gamification, confounding factors have two main aspects (Hamari et al., 2014):

1. The role of the context being gamified (Domain of deployment)
2. Qualities of the users (Individual differences)

Could these contextual factors in many cases act like confounding factors? Particularly in regard to individual differences. Contextual factors are factors derived from the social environment, the involvement of the user and the nature of the system. In some cases, these factors could be regarded almost as confounding factors, if one sorts the social environment and nature of the system perspectives into 'The role of the context being gamified' (the first confounding factor category) and user involvement under 'Qualities of the users' (the second confounding category), as done below.

3.1 Role of the context

The aim for this review paper is to sort out different factors mentioned in other articles that seem to have particular importance on whether or not gamification will be successful. Therefore, each of the six primary domains for gamification are listed below together with the corresponding findings.

Education/learning:

'Education applications of gamification refer to using game elements for scholastic development in formal and informal settings' (Seaborn & Fels, 2015, p. 20). Richards et al. (2014) give an excellent example of showing the importance of analyzing context in their design of a framework designed for educating children about nutrition and fitness called Edufitment. Through Edufitment, children were taught about nutrition through a game. However, through an investigation of their stakeholders, they discovered how children were not able to choose what they ate themselves because of a lunch program. Stakeholders here include the end users, domain experts, representatives from the hosting organization, experts with broad understanding of the target users and people that will maintain the system over time.

Additionally, due to a nutrition program called We Can!, stakeholders gave the authors another restriction on the design of the system that forced them to rethink their service; daily screen time for children should be limited to fifteen minutes. Had the authors not considered the context of deployment and feedback from stakeholders, chances are they would have launched the game and there would have been a disconnection between what the children were taught to eat, and what they actually had the possibility to consume as well as being conflicting with the We Can! program (p. 217).

An individual's personality and learning style seem to be important contextual factors within the domain of education (Buckley & Doyle, 2017). An individual's personality determines how a person will 'experience and perceive the world' (p. 45), and learning styles affect how a user would 'receive, interact with and integrate educational material' (p. 45). For instance, the authors wonder if an extroverted person would respond better than an introverted person to external motivational rewards, that are often used in gamification (and pointsification). Not only would knowing these individual characteristics impact the experience of gamification, it would also enable more successful integration of gamification into the learning environment (p. 43), and thus a more effective end product. Additionally, Buckley and Doyle suggest that 'other variables such as age, gender and education are likely to also have significant effects' (p. 54). However, more investigation is needed into these factors and their impact on the outcomes of gamification.

Another contextual factor that could affect whether or not a gamified solution would be deemed effective, is whether or not an individual has access to the equipment and facilities (the likes of Internet and computers) that would be needed to even use the product. If some of your intended users are not able to use the end product, creating the service could end up being a waste of time and resources.

Business and commerce:

Business and commerce refers to applications of gamification that typically is applied in a workplace or marketing setting. According to Hamari et al. (2014), current studies on motivational affordances in relation to gamification 'suggest that the context of the service might be an essential antecedent for engaging gamification' (2014, p. 3030). To give an example, the authors suggest that 'services oriented towards strictly rational behaviours [such as in the context of e-commerce sites and businesses], might prove to be challenging systems to be gamified as the users could be geared towards optimizing economic exchanges' (Hamari et al., 2014). Hamari et al. also refer to self-determination theory by Deci and Ryan (Ryan & Deci, 2000), explaining how putting outside pressure on a user, and trying to motivate by giving the user extrinsic rewards such as monetary rewards, could threaten intrinsic motivation (p. 3030) and consequently lead to less effective gamification. Additionally, in a business setting, Richards et al. (2014) mention that Gartner, Inc. has identified that 80% of those that do not 'clearly identify business objectives and provide a thorough analysis of how gamification can fulfil those objectives' (p. 219) will fail.

Health and wellness:

'Applications in health range from personal healthcare to professional development' (Seaborn & Fels, 2015, p. 25). Also in this domain, considering the social environment of your user is important. As Richards et al. (2014) point out, changing children's eating habits can be a difficult task, as children are not in control of what their parents or provider buys and cooks. They do not have complete control of their own lives. In other words, they lack the means to change their own behaviour. Furthermore, one should look at who is involved in an activity. Will other people than the user be affected by the outcome of the gamification (2015)? Another concern within the domain of health and wellness is also related to user involvement. A user may for instance have physical limitations

that could limit them from executing fitness exercises in a training app. Therefore, it is of high importance to 'understand and work with the limitations of the target population' (Richards et al., 2014, p. 224) and an individual's capability to change. Other factors involve the importance of an end goal vs. the journey to getting there in e.g. a training app (2015). The way a user gets to log their activity also seems to have an impact on the efficiency of gamification, as this could be done manually or automatically, depending on the type of activity and available technology. In the case of manually logging diabetes, in a study reviewed by (Seaborn & Fels, 2015), few did log their progress. Those that did (only 27%), however, increased their testing frequency and decreased their blood sugar level. The final contextual factors in the health and wellness domain that could be worth looking into is the 'treatment' location and intrusion into daily activities. Can the inherent activities of a service be contained within the application device (for example mindfulness exercises that only require a smartphone), or does the service require additional equipment and space? Is it time-consuming?

Online communities:

In online communities, individuals are given the possibility to chat with 'like minds, generate discussion and build relationships around specific topics' (Seaborn & Fels, 2015, p. 24) Also in an online setting, acknowledging the social environment (although digital) is of importance. Seaborn and Fels mention, for instance, that it is important to consider *how* people communicate and the *way* you allow them to communicate. Is it done in forums or direct chats? Since an online community happens behind screens, another factor to consider is your users' degree of anonymity and the way their social status is portrayed (Seaborn & Fels, 2015).

Crowdsourcing:

Crowdsourcing aims to collect the power, votes or money from a large group of people towards a unified goal. In some cases, where the gamification had been deemed successful, results

may not have been positive due to the gamification itself. Rather, the activity of the app may have addressed social psychological incentives instead (Seaborn & Fels, 2015), which seemed to be the case of an app called UbiAsk, referred to by Seaborn and Fels as ‘a mobile crowdsourcing application for human-powered image-to-text-translation’ (p. 25). During the process of collecting people’s power, it is also mentioned how it could be of importance to look into what happens when people donate from their ‘source’ - the ‘source-response’ - be it their answers, translations, comments or money.

Sustainability:

According to Seaborn and Fels (2015), ‘sustainability applications seek to support and encourage sustainable behaviours, such as reducing the amount of resources used, investing in recycling initiatives and renewable forms of energy, and reusing material whenever possible’ (p. 25). No contextual factors were mentioned in relation to this domain in the reviewed articles. However, a short discussion of what seems like possible contextual factors to look into are discussed in the next section.

Another important aspect to address within the role of context has been observed by Richards et al. (2014) and is applicable for all the above-mentioned domains. To have an end product that is successful, it is also important to ‘address post-deployment concerns during the development process’ (p. 225); How can users’ privacy be ensured? Who will maintain the system after it has been deployed? And who will handle further development and growth of the service? These are three very important questions that should be answered during a development process.

3.2 Qualities of users

People have different inherent qualities, and the users of a service will therefore also vary greatly. Seaborn and Fels (2015) observe how in some of their researched studies, it is mentioned that the effect of gamification varied among individuals and that ‘demographic variables and the

expectations attached to those variables had an impact on the effectiveness of gamification factors’ (p. 28). As an example, the authors refer to Bagley (2012), who shows how age and familiarity with gaming could add to a person’s interest of and how much they would use a system. Additionally, Seaborn and Fels mention how personal perception is a factor that would perhaps never be resolved, but that may very well affect how a gamified solution is perceived by a user. On the other hand, according to Deterding (2015), a user’s perception of an activity as ‘work’ or ‘play’ ultimately depends on the user’s situational framing’ (p. 303) that is afforded by objects and the context, although their experience is not determined by it.

Richards et al. address several contextual factors that should be taken into consideration when designing a gamified service. As an inclusion to the examples in 3.2 Role of Context, the authors additionally list the following design recommendations for taking context of deployment into consideration, to achieve a successful end product: ‘It is important to be sensitive to cultural differences within the target population’ (Richards et al., 2014, p. 225). Not only language barriers could be a concern; diets may also differ vastly across cultures, and if you are designing an app for changing nutritional habits, for instance, if your users are not familiar with the food that is presented, they might dislike using the app or even stop using it completely. Other user related contextual factors that are mentioned by Richards et al. include an individual’s ability to travel, restricted availability due to work and family obligations.

Overall, it is important to also take into account contextual factors in a design process rather than looking at isolated game mechanics and dynamics if one wants to create a successful end product. Deterding (2015) critiques many methods for gamification’s portrayal of making an activity enjoyable by adding inherently enjoyable game elements that ignores the elements of a service’s ‘systemic-emergent thrust’ (p. 309). One should attempt to choose

game elements and dynamics that fit the contextual factors.

4. DISCUSSION

There seem to be many factors that may, if considered and taken into account during the development of a service, contribute to successful gamification. Takeaways from looking at articles that have described factors that have emerged from studying the different domains are discussed and summarized below.

Education/learning takeaways:

In the case of Edufitment, the social environment put a restraint on a user in what actions they were able to perform, so the user could not be involved in the system in the intended way. In the research phase of a project, look into if there is a possibility that the environment could limit a user in some way (limit user involvement) and if it clashes with the goals for the service. This could be either in the form of people limiting a user, or a lack of equipment and facilities to be able to take use of the service. An individual's personality and learning style also seem to be important contextual factors within this domain. Additionally, age, gender and level of education might also have an impact on the outcome of gamification, but no conclusions have been made on these last three factors.

Business and commerce takeaways:

First of all, Double check if gamification really is the right solution for your business. This is a general rule, but seems to be especially important here due to the rational nature of business and commerce. In terms of the social environment, contextual factors could be related to the voluntariness a user has been given to follow through with a task. As outside pressure has been suggested to undermine intrinsic motivation, forcing a user to perform a task - forced user involvement - should be avoided and the kind of reward a user is given should be carefully considered based on the context and the design of a gamified service as a systemic whole. Identifying business objectives is also of

crucial importance for a successful gamification application within this domain, as the only 20% that will succeed are those who do.

Health and wellness takeaways:

The social environment can affect the degree of user involvement within a service. It is important to figure out if the users themselves possess the power to change, and if they do not, then figure out who does. If a user frequently uses a training app, they could improve their health. An end goal could be motivating. However, in fitness, the journey towards a goal could be argued as equally important. It could also be difficult to define an end goal, as one physical shape could 'always' be improved.

If the goal for a gamified service is behaviour or habit change, the way a person will change could also impact friends and family, for better or for worse. This should be taken this into consideration in a development process. For instance, if you have improved your social skills, the people you interact with aren't directly impacted by your change in social skills (Seaborn & Fels, 2015). They do not necessarily change even though you have. In the case of logging one's activities, it is perhaps arguable that applications that allow automatic logging of activities might be better. After all, only 27% of the users that were given the task to log their diabetes did so, even though the application turned out to be useful for those that managed it. Perhaps the action of measuring one's blood sugar is bothersome enough in nature that one does not want another chore in addition. Finally, whether a service is an intrusion into daily activities is an interesting factor. It seems important that a gamified service helps a user towards reaching their goals or treating their illness, but using a product should not take up more time than necessary or give the user frequent negative reminders reminding their users that they are not healthy, for instance.

Online communities takeaways:

Considering the social environment of an online service, if other users can see your status, how is it communicated to others? And how do your

actions impact your status? These are two questions that could be asked if you wish to create a successful gamified service within the domain of online communities.

Crowdsourcing takeaways:

When you wish to design a service that aims to use crowdsourcing, research says it is important to keep social psychological incentives in mind. Also, consider what the 'source-response' should be. How do people get feedback from donating their source? Keep in mind that rewards should support a challenge or action and be meaningful for the user (Nicholson, 2012). This is also globally applicable in other domains of deployment.

Sustainability takeaways:

No explicit contextual factors for this domain are mentioned in the reviewed articles. Nonetheless, some factors seem like they might be interesting to look into. These are related to both individual differences and the social environment. The first two factors are the means and motivation a user has to change. A person must have the possibility to choose more environmentally-friendly products and must at the same time be willing to make some changes to their everyday life. Social impact, such as peer pressure or simply being affected by the habits of friends and family, might also affect some people's motivation.

A summary of all the takeaways in relation to the social environment, user involvement and nature of the system can be found in Table 1 as an Appendix to this article.

It is important to design one's system as a systemic whole; recognizing the importance of spending time on user research. Not doing so might cause your gamification to be unsuccessful, and factors that could have been found during a user research phase, could end up acting like unknown confounding factors in your solution. That is, knowing your users well may reveal some of the individual differences that might otherwise have affected game elements, goals, mechanics, challenges and rewards of a gamified system.

Although user qualities like personality could be very hard, or impossible, to reveal, chances are it could still be beneficial to be aware that these contextual factors should be considered, as it may take your design in a new (and hopefully better) direction. It is also important to address post-deployment concerns, such as the privacy of users and the maintenance and further development of the system.

It has been suggested (Hamari et al., 2014) that in order to see how the outcomes are affected by the context, future studies could implement specific gamification elements, or motivational affordances, and hold them constant while at the same time varying the underlying context. However, this approach should be discouraged as isolating individual elements would be dangerously close to taking a pointsification approach to gamification; It is not the single elements that make a difference on whether or not gamification will be successful, but rather how they support one another and contribute to the overall experience of the gamified service.

4.1 Further research

A lot of descriptive research on the topic of gamification has been conducted. Additionally, some theories and ideas for frameworks and guidelines have emerged over the last couple of years. These still remain to be tested and measured up against each other in order to see which work best/are the most correct. A further and more thorough literature review should be conducted in order to reveal more contextual factors, as the list presented here is incomplete. For future article searches, the search terms situational relevance and gamification as well as contextual design could be beneficial. One thing is identifying contextual factors. Another is developing methods for exactly how to design for these factors while at the same time also making sure the other gamification elements support each other to design for systemic emergence. These 'hows' are needed.

4.2 Limitations

In addition to the limitations concerning database search mentioned in the methods section, here are some other limitations for this review paper:

Although research indicates that gamification does indeed produce positive effects and benefits, as can be read in Hamari, Koivisto & Sarsa's (2014) literature review, these reported effects are descriptive, that is, the gamification may have been reported as having been received as positive by the users, but no actual conclusions about what exactly did lead to effective gamification were made. Consequently, inferential statistics is needed in order to be able to make generalized conclusions about the topic.

5. CONCLUSION

From a designer point of view, conducting thorough user research is of high importance to get an end product that suits user needs and limitations. The same should be done for gamified services, where an investigation of possible contextual factors and how they could affect a gamified service's degree of success should be part of the insight phase, before prototyping even starts. Generally, do not generalize. Customization is key. If a gamified product can be deemed successful, it suggests that one not only has chosen the right motivational affordances, but also that the situational relevance and contextual factors have been taken into consideration.

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APPENDIX

<i>Domain</i>	<i>Contextual factor</i>	<i>Social environment</i>	<i>User involvement</i>	<i>Nature of the system</i>
<i>Education</i>	Stakeholder investigation		X	
	Personality		X	
	Learning style		X	
	Age*		X	
	Gender*		X	
	Level of education*		X	
<i>Business and commerce</i>	Access to equipment and facilities	X		X
	Rational nature of system			X
	Identification of business objectives			X
<i>Health and wellness</i>	Control over own life	X		
	Identification of involved parties	X	X	
	Capability to change		X	
	End goal vs. journey	X	X	
	Logging of activities			X
	Treatment location			X
	Intrusion into daily activities	X		X
<i>Online communities</i>	How people communicate	X	X	
	How people are allowed to communicate			X
	Degree of anonymity			X
	Portrayal of social status			X
<i>Crowdsourcing</i>	Social psychological incentives	X	X	
	Source-response	X		X
<i>Sustainability</i>	Means to change*	X	X	
	Motivation to change*	X	X	
<i>Miscellaneous</i>	Familiarity with gaming		X	
	Personal perception		X	
	Cultural differences	X	X	
	Restricted availability	X		
* : More research needed to determine effects				

Table 1: An overview of contextual factors in relation to their respective domains, categorized with respect to social environment, user involvement (user differences) and nature of the system.