

Integrating Gamification: The Human-Centered Gamification Process

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Abstract: The dynamically growing research area of gamification is loaded with a lack of consensus on definitions, a variety of non-validated frameworks, and few practical insights. Hence, we conducted a literature review to explore current best practices in applying gamification for integration in a practical use case. Instead, we found a narrow focus on theoretical discussions. For a stronger representation of practical research, standards need to be established for transferring gamification concepts to practical application. To fill this research gap, we designed a process and tools for a practical, human-centered, and context-related gamification application. We derived the process and tools from insights of our literature review as well as the realization of a gamification use case on a German online comparison platform. In addition, we incorporated standards such as the *Human-Centered Design Process* to maintain the established quality level of the field of user experience. In this paper, we present the *Human-Centered Gamification Process (HCGP)* and provide tools as practical guidance to lower the barrier for researchers and professionals to conduct theoretical and practical gamification projects.

1 INTRODUCTION


The field of gamification is characterized by various theoretical perspectives and frameworks (Deterding et al., 2011b; Deterding et al., 2011a; Nicholson, 2012; Deterding, 2015; Arnab and Clarke, 2017; Morschheuser et al., 2018). To capture the current state, we reviewed 47 publications n_{all} . From these, 27 provide theoretical perspectives on gamification (n_{theory}), 27 assumptions and insights about practical application ($n_{practice}$), and 24 cover methodological approaches (n_{method}). This tri-fold selective literature review shows an ongoing transformation process from a theoretical focus (Hamari, 2013; Adamou and Birks, 2013) to first practical methodological steps.


Only few of the publications with practical approaches ($n_{practice} = 27$) explain how they designed the gamification, e.g., by naming selection criteria for gamification components or surveying users about their needs (Sailer et al., 2017; Rodrigues et al., 2016). Hence, little is known about the practical application process of gamification. This can be-


come a blocking factor for gamification projects, if researchers and professionals do not have practical experience to fall back on. They are left alone to interpret the variety of perspectives on gamification and their applications. Processes of related fields, such as the *Human-Centered Design Process (HCD)* (DIN Deutsches Institut für Normung e.V., 2020), could be used to fulfill the need for guidance to some extent. However, this process is rather generic and does not practically guide users to apply gamification.


In this paper, we introduce the *Human-Centered Gamification Process (HCGP)* and its tools (*gamification codebook & guidelines to integrate gamification*) to support researchers and professionals in transferring theoretical gamification concepts into practical application. We show how we designed the process and tools in a practice-oriented three-stage design approach as human-centered and customizable resources for different project contexts. Altogether, we provide a guided way to integrate Gamification rather than layering it on top of a system (Rauschenberger et al., 2019).

The paper is organized as follows: In Section 2, we explain current methodologies and concepts to research gamification. In Section 3, we show how we designed the *HCGP* and its tools (*gamification code-*

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book & guidelines to integrate gamification) before explaining each of them closer in Section 4. In Section 5, we conclude with ways researchers and professionals can benefit from our work and make suggestions for future research.

2 BACKGROUND ON METHODOLOGICAL APPROACHES

Literature shows that methodologies in gamification often concentrate on theoretical explorations, frameworks, and literature reviews, but neglect practical approaches (Ritzhaupt et al., 2014; Keusch and Zhang, 2017; Rauschenberger et al., 2019). For a first understanding, we explored the current methodological state from 24 publications (n_{method}) of our literature review ($n_{\text{all}} = 47$). We clustered these publications into analytical & indirect approaches (*passive methodology*: 19/24) vs. experimental & practical approaches (*active methodology*: 5/24).

The 19 publications of the first cluster are ordered into five categories. The first category of *literature review & theory-based* covers the most publications (15/19), which, e.g., review concepts and sample cases (Kankanhalli et al., 2012) or issues in gamified surveys (Keusch and Zhang, 2017). The remaining four publications belong to the categories of *survey* (Codish and Ravid, 2014), *literature review & semi-structured interview* (O'Brien and Toms, 2008), *content analysis* (Laschke and Marc, 2011), and *content analysis & interview* (Björk et al., 2003). The five publications of the second cluster are ordered into four categories: *research games: gamified surveys* (Schacht et al., 2017), *research games: fully-fledged game* (Adamou and Birks, 2013), *experiment: implementation of gamified features* (Hamari, 2013), and *experiment: fully-fledged game* (Rodrigues et al., 2016; Sailer et al., 2017).

From our literature review n_{all} , we found that gamification has a strong theoretical fundament including assumptions and concepts about practical application ($n_{\text{theory}} = 27$, $n_{\text{practice}} = 27$). But it is weakly represented by practical methodology for empirical examination ($n_{\text{method}} = 24$). Only 5 publications use active methodology including experimental & practical approaches. We found that many theoretical frameworks exist but no standard has established yet for integrating gamification in practice. This results in a potential barrier for researchers and professionals, since they have to fall back on individual experience instead of established processes. They must find a reason-

able way to apply theoretical gamification concepts in practice on their own. In the next section, we show how we designed a process and tools to facilitate the conduction of practical gamification projects.

3 METHODOLOGY

In a three-stage design approach (see Fig. 1), we created a process and two tools to provide practical guidance in applying gamification concepts to a human-centered and context-related application. First, we designed the tools, called *gamification codebook & guidelines to integrate gamification*. They provide gamification components, criteria, and lessons learned from literature about human-centered gamification application. Second, we applied the tools to integrate gamification into a use case on a German online comparison platform. Third, we merged the insights into the *Human-Centered Gamification Process* (see Fig. 2). The stages were conducted as follows.

In the first stage, we built the *gamification codebook* from insights about practical gamification and human-centered design (n_{practice}). Then, we created the *guidelines to integrate gamification* based on lessons learned about methodologies (n_{method}).

In the second stage, we used both tools in a use case to uncover barriers of applying gamification step by step. The company provided data as personas as well as a customer journey map of the target system that included dropout and satisfaction tracking. From the data, we derived system requirements to follow a human-centered and integrative approach (Carlshamre, 2001). For this, we defined needs and motivations of target system users. To cover the organizational perspective, we identified target areas of the customer journey by a relatively high dropout rate compared to other areas. With the *gamification codebook* we identified components in three competitor solutions to capture the status of gamification in the related market environment. We took screenshots and marked representative gamification examples to work with them later. Then, we merged user needs and motivations, target areas of the customer journey and gamification examples from competitors into comprehensive system requirements.

Next, we customized the *gamification codebook* by prioritizing its components according to their relevance to our system requirements. For example, *points* were highly prioritized because the target system users tend to participate in bonus systems.

To prepare the practical application of the concept, we oriented towards the walkthrough method. For this, we rebuilt the target system as a prototype.

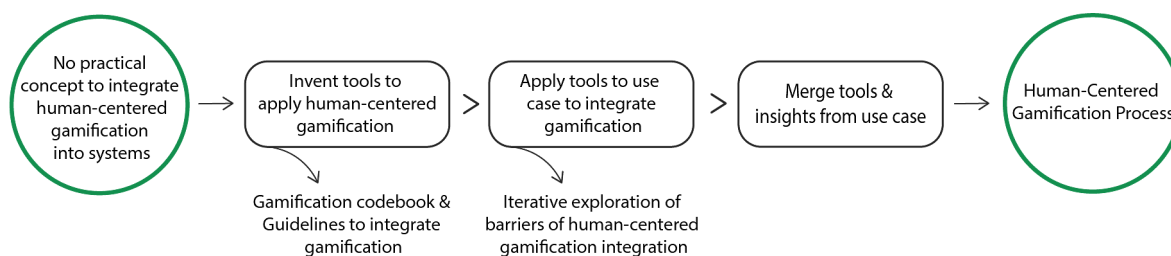


Figure 1: Process of designing the Human-Centered Gamification Process.

Then, we derived the happy path (most direct way for users to walk through the system) as a structured table. Based on that, we were able to verify the applicability of each component of the customized codebook for the elements of the prototype and happy path. We choose and merged the verified components with prototype elements into a coherent design concept. Here, the examples from competitor solutions, system requirements and *guidelines to integrate gamification* led us in designing a human-centered gamification concept for the target system.

Our approach of designing tools and applying them to a use case highlighted barriers for integrating gamification. With the tools, many hurdles could be overcome; *e.g.*, one could analyze the market towards gamification usage with the *gamification codebook*. Another lesson learned from the use case is that the available resources determine what methods are realizable for applying gamification.

In the third stage, we merged the insights from our literature review (n_{all}), tools and practical use case into the *Human-Centered Gamification Process*. With respect to established standards in the field of user experience, the iterative characteristics of the *HCD* process were incorporated. In the next section, we present the *HCGP* and its tools in detail.

4 PROCESS AND TOOLS FOR HUMAN-CENTERED GAMIFICATION

In this section, the *HCGP* and its tools are explained (see Fig. 2). We show how both add value to the gamification field by guiding its users individually and systematically towards a human-centered integration.

4.1 Human-Centered Gamification Process

We designed the *Human-Centered Gamification Process* and its tools to establish a way for researchers and professionals to conduct theoretical and practical

research on gamification individually as well as in interaction with each other (see Fig.2). The *HCGP* consists of eight steps in two iterative cycles to be flexibly adaptable for any kind of project context, goal and available resources. The detailed conduction of the steps can be followed from the use case in the previous section. Alternatively, users can adapt the conduction of the single steps to available resources, individual experience and preferences.

As mentioned in the section before, the *HCGP* incorporates the iterative character of the established *HCD* process. We split the four generic steps of the *HCD* into eight concrete and actionable chunks to provide realistic and practical guidance for users to apply gamification. The tools of the *gamification codebook & guidelines to integrate gamification* assist users in applying the *HCGP* in practice. In addition to the main perspective of a human-centered application in the *HCD* process, we encourage users to interweave gamification with the system context rather than layering it on top. This unique character sets the *HCGP* apart from the *HCD*. We designed it specifically to fulfill the research need for practical guidance to apply gamification and overcome obstacles in doing so.

Users initialize the *HCGP* with the starting issue of low user engagement and/or satisfaction. In the first cycle, *Setup Gamification Concept*, the *gamification codebook* assists users in working out an individualized concept that focuses on user needs and the system context to address the starting issue (*steps 1 - 5*). The first cycle has a low iteration dynamic because the evolved concept is rather stable in the long term. It only needs to be rerun if attributes (user needs, organizational goals, market environment) change. Next, users transfer the designed gamification concept to the second cycle, *Gamification Integration (step 6)*. In the second cycle, the *gamification codebook and guidelines to integrate gamification* support users in following a human-centered and integrative prototyping and evaluation approach (*steps 7 - 8*). This second cycle requires a high iteration dynamic to actively integrate user feedback into the designed gamification solution. At any time within both cycles, users can

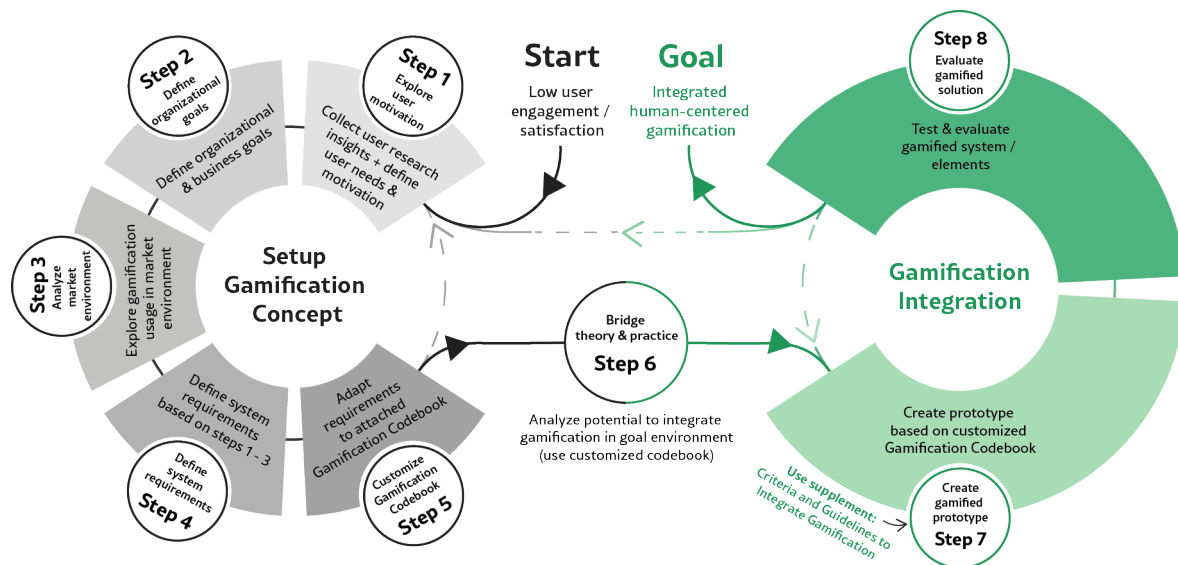


Figure 2: Human-Centered Gamification Process.

jump back to any step to start another iteration from there. The process was applied successfully when the evaluation outcome confirms an optimization of the starting issue (e.g., a decrease in the dropout rate as an indicator for increased user engagement). In the next subsection, we explain the essential tool of the *gamification codebook* for applying the *HCGP*.

4.2 Gamification Codebook

In the *HCGP*, the *gamification codebook* functions as three things: a customizable modular system to design individual gamification, an analysis tool to evaluate the degree of gamification in a system, and a checklist to evaluate and ensure a human-centered focus in gamification integration.

For the first function, the codebook is composed of 58 gamification components, which we identified from our literature review (n_{practice}) and grouped into 11 themes. For example, we grouped *story*, *theme*, *framing*, *narrative* and *fantastic scenario* in the theme *narratology*. From the codebook, users can select gamification themes and components (step 5) that are in accordance with the defined system requirements (step 4). The resulting customized codebook is the basis for steps 6 - 8. To provide first orientation in this selection process, we included a frequency distribution. Each component was counted by its occurrence within the literature (n_{practice}). This provides users with an overview about the popularity of the components relative to one another and within the literature. For the second function, the codebook can be applied to analyze the status of gamification in competitor solutions. For the third function, it serves as

a checklist for users to follow a human-centered integration of selected themes and components (steps 7 - 8). The checklist can also be applied to analyze existing systems (step 3).

With the *gamification codebook*¹ as a flexible open source tool for analyzing and integrating gamification, we add a high degree of practical applicability to the *HCGP*. In the next subsection, we explain the second tool.

4.3 Guidelines to Integrate Gamification

To provide assistance in step 7, we worked out following 11 guidelines from nine publications of our literature review. Users are guided to interweave gamification within the existing system instead of layering it on top (Rauschenberger et al., 2019). The guidelines lead to an increased focus on user needs and raise awareness of the risks of applying gamification (e.g., backfire effects such as game fatigue (Direkova, 2012)). They help users to avoid common pitfalls when applying gamification, providing support in designing a worthwhile user experience.

Take Heed of the User's Motivation

- The motivational pattern must be received as such by the user, otherwise there is no effect. Therefore, to be motivational, gamification elements must show some presence, but must not overwhelm or distract users (Lewis, 2014).

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- Do not be a tyrant of choice, as “[...] people are most satisfied when choice increases from zero to one” (Zichermann and Cunningham, 2011). Therefore, do not overwhelm people with too many gamification features and choices.
- Create a worthwhile experience (Laschke and Marc, 2011).

Take Heed of the Target System’s Requirements

- Integrate gamification instead of layering it on top of your application to maintain a coherent and meaningful digital product (Adamou and Birks, 2013).
- Implement gamification as easy to use and useful for a higher acceptance of new feature (Davis, 1989). If features make the process harder and/or are not useful, rethink their implementation.
- Beware of orienting blindly towards other practical examples, as “[...] many current gamification attempts are only copycat applications” (Burke, 2011).
- Consider the stage of the user journey when implementing gamification. It is not only the main context of the application that influences gamification effects, but also the context of the current step of the users. Users expect different features and functions in each stage (Direkova, 2012).

Take Heed of Negative Effects

- Beware of game fatigue. Too much gamification overburdens users and desensitizes them to motivational effects (Direkova, 2012).
- Beware of undermining effects. Extrinsic motivators can undermine initial intrinsic motivators after time and weaken the motivation effect (Reiss, 2004).
- Be aware that behavioral outcomes have not yet been researched well. “There is a strong possibility for gameful patterns to backfire, encouraging unexpected and undesired behavior” (Lewis, 2014).

In the next section, we conclude with the value of the presented process and tools for the field of gamification and its users. We also reflect on our presented work and make suggestions for further research.

5 CONCLUSION

In our research, we uncovered the current gap of practical research approaches towards gamification.

We conclude from our selective literature review on methodologies that there is no established standard yet to transfer theoretical gamification concepts to practical application. This can result in a barrier for researchers and professionals to conduct practical research on gamification as the quality of the integration is based on individual experience. Thus it can happen that users are left alone to interpret the variety of theoretical perspectives and their applications.

As first steps to address this research gap, we designed the *Human-Centered Gamification Process* and tools (*gamification codebook & guidelines to integrate gamification*). We designed the process to consist of two cycles. So, users can conduct theoretical and practical research on gamification independently or in interaction by combining the cycles. This makes the process and tools flexibly usable for any kind of project context, goal, and available resources. Within the cycles, we incorporated characteristics of the *HCD* process to maintain the established quality level of user experience. The process and tools add realistic value for its users to overcome obstacles when applying gamification. Overall, with the *HCGP* and its tools, we present an initial approach to fulfill the research need to bridge the gap between theoretical and practical research in order to integrate human-centered and context-related gamification.

As next steps, we plan to evaluate our process and tools with users of the gamification field using *HCD* methods. Thereby, we can deliver a practically validated approach to fill the research gap for researchers and professionals. We also plan to replace our literature review with a systematic literature review to add more transparency to our argumentation. In the long term, we aim to develop a standalone and interactive digital product that makes the process and tools easily accessible and usable. By doing so, we hope to further lower the barrier for researchers and professionals to conduct theoretical and practical gamification projects.

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