Chapter 4
Translating Games Into Effective Health Results Using Digital Tools

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ABSTRACT

The use of gamification in the health context, especially to trigger behavior change, has assumed a particular relevance. However, the scientific evidence that supports the effectiveness of gamified methodologies has constituted a barrier to the implementation of projects. This chapter draws on a review of this theme, identifying barriers and opportunities for using gamification mechanisms. Results show that digital games are often considered as more enjoyable, engaging, and interesting solutions that are able to increase access, autonomy, self-efficacy, compliance to treatment, and knowledge acquisition. However, most studies reported a high risk of bias due to small-sized samples, short follow-up times, and lack of randomized control trials or more robust study designs. Therefore, future research should target older adults, ensure longer periods of follow-up, bigger samples, and include randomized control trials. Involvement of patients and health professionals is also a key component to ensure a more effective and regulated delivery of such solutions within the healthcare system.

BACKGROUND

Gamification is an approach based on applying game mechanics elements to non-game contexts to make them more engaging (Deterding, Dixon, Khaled, & Nacke, 2011). Conceptually, this term sits at the intersection of persuasive technology and personal informatics (Markopoulos, Fragkou, Kasidiaris, & Daim, 2015). Like persuasive technology, it revolves around the application of specific design principles or features that drive targeted behaviors, in order to enhance motivation, concentration, ef-

fort and loyalty, among others, and is about establishing a strategy to influence and motivate groups of people (Kawachi, 2017). It has been increasingly applied to the healthcare domain given it constitutes a "cost- and resource-efficient method" to provide health interventions (Cheng, Recommendations for Implementing Gamification for Mental Health and Wellbeing, 2020). According to the literature, gamification seems to have a positive impact on health and well-being (Johnson, et al., 2016), contributing to helping individuals induce positive health behavioral change (Sardi, Idri, & Fernández-Alemán, 2017). The underlying idea of gamification is to use the specific design features or "motivational affordances" of entertainment games in other systems to make engagement with these more motivating (Deterding, Dixon, Khaled, & Nacke, 2011).

Compared to traditional persuasive methods, gamification is posited to offer several advantages, by generating positive experiences of basic psychological need satisfaction as well as other elements, like positive emotions, engagement, relationships, meaning, and accomplishment (King, Greaves, Exeter, & Darzi, 2013).

Current health gamification domains cover all major chronic health risks: physical activity, diet and weight management, medication adherence, rehabilitation, mental well-being, drug use, patient activation around chronic diseases like diabetes, asthma, or cancer (Sola, Couturier, & Voyer, 2015). Evidence also supports gamification as a tool to support other health related outcomes, including nutrition and medication use, as well as mental health outcomes, including personal growth, flourishing, stress and anxiety management (Comello, et al., 2016).

From Entertainment Gaming to Serious Games

In the book "The Art of Game Design", Jesse Schell defines a game as "a problem-solving activity, approached with a playful attitude" (Schell, 2015), that is, a problem-solving activity that is approached with a playful attitude on the part of the player.

This game definition becomes relevant for two reasons. The first is to focus on the problem-solving characteristic as something inherent in any game, either by getting more points than the opponent and defeating it in a game, or by completing a puzzle and finding the exit key from a room. That is, any game has an objective; and from the moment it has an objective, it presents a problem for the player to solve. The second reason is player motivation. Schell argues that a game being only a problem-solving is a broad definition, which includes several other activities such as the individual's own work. For this, the player's motivation to play becomes an important factor, as he cannot be forced to play, but must do so of his own volition.

Rajat Paharia, one of the original pioneers in the gamification space, presents 5 intrinsic motivators that determine the focus of the players:

- **Autonomy** – being in control is important for the users, since there is a feeling that that specific reality is only commanded according to the player's response.
- **Mastery** – improving player skills is also a source of motivation. The game user wants to do more and better as he/she gets to know the platforms he/she uses for fun.
- **Purpose** – many of the games are involved in a purpose exposed by a successful narrative. Being a superhero, saving someone or defeating a villain makes players feel like they are making a difference.

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