Chapter 5
Gamification:
Applications for Health Promotion
and Health Information
Technology Engagement

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ABSTRACT
Game-based approaches (gamification) can provide ideal strategies for health promotion, prevention, and self-management of chronic conditions. However, there is a need to clearly define components and uses of gamification in healthcare for increased patient engagement in health information technology. Therefore, this chapter aims to define gamification and components of gamification, identify relevant research and examples of gamification in regards to health promotion and prevention, discuss strategies to gamify a health application, and summarize current research in the area of gamification for health promotion/prevention. Finally, this chapter provides an overview of gamification applications and how it can be used for health promotion.

INTRODUCTION
Playing video games is a favorite leisure time activity of many people worldwide. Globally, nearly 667 million people play video games (McGonigal, 2011). All games contain four basic characteristics, which include goals, conflict, rules, and ability to win or lose (Schell, 2008). These characteristics and the popularity of playing games provide an ideal medium suitable for health communication and education, which has spurred the growth of games for health, sometimes referred to as serious games for health. Games for health are digital games designed specifically for health education purposes and in addition to containing traditional game qualities, share many of the following features: delivering health content and messages, providing behavioral-theory-based interventions; allowing goal setting, measurable skill-gains, and evaluations; and measuring health behavior change outcomes (Hall & Marston, 2014).
In addition, many organizations and companies have added game-oriented approaches to promote their products or services (i.e., gamification) with great success. Gamification approaches such as adding quests, missions, badges, rewards, leader boards, and social referral components (e.g., four-square) are used in health games to encourage consumers to be active participants and to create content in favor of the product or service offerings (Peters, 2012a/b). Research indicates that many of these approaches may increase engagement in health promotion technology based interventions (Baranowski & Frankel, 2012).

Games for health and game-based approaches (gamification) can provide strategies to motivate patients in health promotion, prevention, or chronic disease self-management behaviors. However, there is a need to clearly define features, components, and uses of gamification in healthcare that would encourage engagement among users in health-promoting applications and devices.

This chapter highlights the current position of gamification in health care related solutions including mobile health applications (mHealth apps), explores the origin of gamification and applications for health, identifies effective gaming approaches (in terms of gamified versus games designed for health), identifies relevant research and examples of gamification with regards to health promotion and prevention, discusses strategies to gamify a health application, and aggregates current research in the area of gamification for health promotion and health information technology engagement.

**BACKGROUND**

Although there is a paucity of interventions that test gamification components for effectiveness in healthcare interventions or clinical applications, gamification as a concept is not clearly defined in the research literature. To understand gamification and how gamification techniques are being applied a brief discussion of the term “gamification” and the domains that currently utilize gamification strategies are necessary. The following sections provide an overview of the term gamification, components of gamification, and examples of gamification, specifically mHealth apps such as Fitbit and Runtastic. While there are many platforms and applications for gamification, mobile applications form the basis of examples for this chapter given the ubiquitous ownership of mobile devices worldwide and the growing number of mHealth applications. For instance, there are almost 7 billion mobile phone subscriptions worldwide, and a global mobile penetration rate of 96% (Sanou, 2014).

**Defining Gamification**

Deterding, Dixon, Khaled, & Nacke (2011) notes the term gamification originated from the digital media industry in 2008, although it was not until 2010 that this term gained acceptance worldwide (Paharia, 2010). A congruence of terms has been used such as “productivity games” (McDonald, Musson, and Smith, 2008), “surveillance entertainment” (Grace & Hall, 2008), “funware” (Takahashi, 2008), “playful design” (Ferrara, n.d), “behavioral games” (Dignan, 2011), “game layer” (Priebatsch, n.d), or “applied gaming” (natronbaxter.com). However, Deterding et al. (2011) suggest the term gamification will “institutionalize itself as the common household term” (p. 9). Groh (2012) refers to the work conducted by Deterding et al. (2011) whereby, gamification is separate from serious games and playful design and aims to facilitate interaction.

Although there is no agreed definition, Deterding et al. (2011) proposed the following definition, “Gamification is the use of game design elements in non-game contexts” (p. 9). Deterding and colleagues (2011) provide a detailed explanation of the origin of the term gamification and further describe support for their proposed definition. For example, Deterding et al. (2011) explain
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