



# GAMES AND GAMIFICATION – Discussions for and against their health benefits

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# Abstract

This paper provides an overview on current trends in how games and gamification may be used for health promotion. The paper consists of a concise review of current literature on serious games development and gamification as a concept. Different types of games currently being either developed, in use or undergoing validation will be described. This is a descriptive account with references to the main health promotion theories underlying the games approaches. Arguments for and against the health benefits of serious games approaches will also be presented.

# Conceptual background: Game development and health behaviour change

Game development involves the application of psychological, social, behavioral, and cognitive science theories and principles from multiple disciplines (Schoech et al, 2013). Serious games for health are designed to entertain players while attempting to modify some aspect of their *health behavior and behavioural change*. Behavior is a complex process influenced by multiple factors, often making it difficult to change. Behavioral science provides insight into factors that influence specific actions that can be used to guide key game design decisions (Zamboni et al, 2011; Thompson et al, 2010).

There are currently many psychosocial models of *health behavior*. They are founded on the common meta-theory that psychosocial factors are heavy contributors to human health. The core set of determinants include knowledge of health risks and benefits of different health practices; perceived self-efficacy that one can exercise control over their health habits; outcome expectations; health goals, and the perceived facilitators and social and structural hindrances to the changes users seek (Bandura, 2004: 144).

Behavioural theories providing mediators for entertainment-based media include social-cognitive, self-determination and transportation theories, among others. Examples of such mediators include immersion, attention, functional knowledge, self-regulatory skill development (e.g., goal setting, self-monitoring, decision making), self-efficacy, internal motivation, and feelings of competence, autonomy, and relatedness (Thompson et al, 2010: 589).

The social cognitive theory – typically used in game designs – offers both predictors and principles on how to inform, enable, guide and motivate people to adopt good habits that promote health and reduce those that have adverse effects (ibid, 145-6). Interactive computer-assisted feedback provides a convenient means for motivating users to make lifestyle changes. The personalized

feedback can be adjusted to participants' efficacy level, the unique circumstances in their lives, and the progress they are making (Bandura, 2004).

Games are often designed to affect an *individual* user's behaviour. One of the individual-focused behavioural theories that may underlie a game approach (or any health promotion intervention) is the Health Belief Model (hereafter HBM). It is based on the understanding that a person will take a health-related action if that person:

1. feels that a negative health condition (i.e., diabetes) can be avoided,
2. has a positive expectation that by taking a recommended action, he/she will avoid a negative health condition (i.e., exercise can help in managing diabetes), and
3. believes that he/she can successfully take a recommended health action (i.e., he/she is able to take exercise over a sustained time period).

The HBM involves four constructs representing the perceived threat and net benefits: perceived susceptibility, perceived severity, perceived benefits, and perceived barriers. These concepts are related to people's "readiness to act." An added concept, cues to action, may activate that readiness and stimulate overt behavior. A recent addition to the HBM is the concept of self-efficacy, i.e. one's confidence in the ability to successfully perform an action. This concept relates to the challenges of changing habitual unhealthy behaviors, such as being sedentary, smoking, or overeating (see Figure 1).

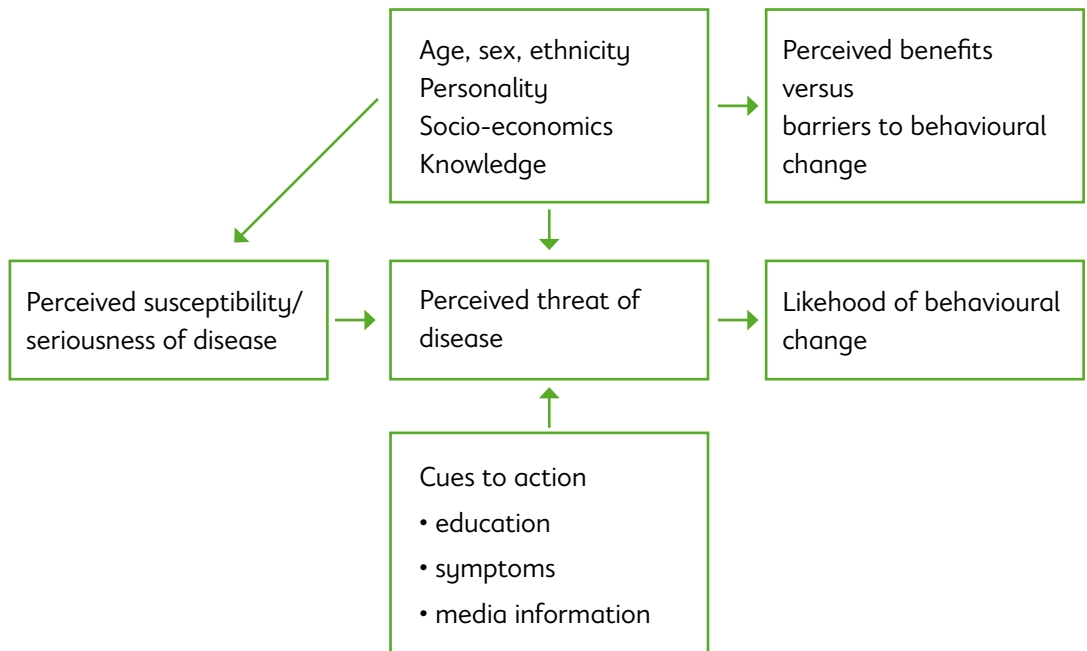


Figure 1. An illustration of the Health Belief Model  
[http://www.utwente.nl/cw/theorieenoverzicht/theory%20clusters/health%20communication/health\\_belief\\_model/](http://www.utwente.nl/cw/theorieenoverzicht/theory%20clusters/health%20communication/health_belief_model/)

## Gamification and games

Gamification is the application of game design elements into existing processes and services in order to engage and motivate including health promotion purposes. It involves processes of using game design techniques, game thinking, and game mechanics in non-game contexts, such as social situations (Schoech, 2013:198).

Although human service professionals understand extrinsic motivators like rewards and reinforcement schedules that encourage repetitive behavior, research suggests that games may motivate and engage due more to intrinsic rather than extrinsic motivation. That is, games motivate by providing feelings of competence, mastery, being in control, achievement, autonomy, choice, and relatedness to others. These concepts are similar to the concept of self-efficacy.

Those approaching game design from a behavior change perspective often use the Theory of Planned Behavior, which identifies self-efficacy, attitudes, norms, and sometimes knowledge as important predictors of behavior change. For Schoech et al (2013: 199), however, gamification is not a straightforward process regarding user health outcomes. What needs to be borne in mind is that:

*“In one of the most challenging areas of the human services, that is, behavior change, game development is in its infancy. Part of the problem is that behavior change is not typically fun and sometimes not voluntary... (A) review of social mobile games suggests that there is a growing clinical trial base of evidence that shows that games can improve players’ health behaviors and outcomes in areas such as addiction control, healthy eating, physical activity, physical therapy, cognitive therapy, smoking cessation, cancer treatment adherence, and the self-management of asthma and diabetes. Although behavior change game development is extremely challenging, the power of gamification strategies to attract users and improve motivation is so great that some experts envision “simpler, easier, sustainable, and fun ways to develop healthier habits based on behavior-change psychology, alternative reality games, and quantified self-methods and techniques” (ibid).*

Games designed for other than entertainment purposes importantly involve the question of ethics: will the games deliver the benefit that they promise or might they, in fact, be harmful to the user?

## On the potential benefit and harm of playing (video) games

Games and play – although targeted at adults as well – are typically associated with children and ‘childlike’ qualities of actions and orientations. Links between children’s play and their development of cooperative skills, social competence and peer acceptance are widely researched (Granic et al, 2014). Major child psychologists – such as Piaget, Vygotsky, Erikson – have suggested strong theoretical links between play and make-believe to foster the development of social cognition. Developmental psychologists have convincingly suggested that a range of feelings and emotions can be productively enacted through play (ibid).

However, the mass use of video games has provoked alarmed reactions regarding their detrimental effect on children. In the United States, it has been estimated that nearly 97% of children and adults play video games for at least one hour per day. Typically, psychological research looking



into the effects of gaming has focused on the negative impacts, i.e. the potential harm associated with violence, addiction or depression. Such a view has been brought to the fore by global media attention surrounding, for example mass killings and school shootings in the US and elsewhere (ibid; see also Anderson et al, 2010 and Ferguson, 2007).

Studies have also demonstrated an association between the amount of time spent on games and other screen media and the risk of childhood obesity. Several mechanisms have been proposed, including the displacement of physical activity or the increased eating of high-fat, high-sugar foods. There are cases of children reporting repetitive stress injuries due to overuse of game controllers: there is, for example, a recognised thumb injury called “Nintendinitis” (Hoysniemi, 2006).

Granic et al (2014: 66) suggest, however, that a more balanced perspective might be required. There have been rapid changes in the gaming industry over the last couple of decades. The positive impacts are associated with cognitive, motivational, emotional and social benefits of gaming. Insights from developmental, social and media psychology have been integrated and several positive directions have suggested mental health benefits (here with the focus on the playing of video games).

Granic et al question simple cause and effect relations that are typically presupposed in the discourses on harm, as well as children’s and youth’s presumed incapacities in separating virtual worlds from reality. Such discourses have been around for long regarding television and parental control over their children’s television viewing. Alternatives to these so-called protectionist discourses do also exist, for instance in childhood sociological research, often stressing children’s agencies and capacities on making moral judgments (e.g. Komulainen, 2007).

Granic et al do not by any means ignore the vast body of research on the potential negative effects of video games. Instead, they point out the currently largely unexplored possibility of the positive effects with a specific attention paid to video games. Video games differ from many other media (such as books, television...) in that they are interactive. There are millions of video games with vastly different themes and goals. These games can be played cooperatively or competitively, alone, with other physically present players or interactively online with thousands of other players. Games can also be played on various devices ranging from consoles to computers to mobile telephones. The levels of complexity and the extent of social interaction thus vary from game to game.

For Granic et al, contrary to conventional beliefs that playing video games is intellectually lazy and sedating, it turns out that playing these games promotes a wide range of cognitive skills (68). However, it is being speculated that games enhance not only spatial but also problem-solving skills, among others. Here the counter-argument refers to physical exercise and a lack of naturally occurring interactions with other people.

Similar kinds of arguments were found in a meta-analysis study by DeSmet et al (2014). Video games are at the center of a debate over what is helpful or harmful to children and adolescents, and there is research to substantiate both sides. The existing research suggests that there are at least five dimensions on which video games can affect players: the amount of play, the content of

play, the game context, the structure of the game, and the mechanics of game play. Others have also suggested that one needs to get beyond the typical “good–bad” dichotomous thinking to have a more nuanced understanding of video game effects and to provide testable hypotheses for future research (Gentile, 2011: 75).

## **Examples of serious video games in health promotion to prevent Type 2 diabetes**

Diabetes 2 is taken as an example here as it is considered as a major public health challenge worldwide and is also targeted by many games approaches. For instance, in an evaluation study with African Americans, a virtual world intervention approach was used (see Ruggiero et al, 2014 for details). The evaluation of the intervention impact used a single-group repeated measures design, including three assessment time points: (1) baseline, (2) 3 month (mid intervention), and (3) 6 month (immediate post intervention). Participants to the study were recruited from a university primary care clinic and a total of 41 participants enrolled in the 6 month intervention study. The intervention components included: (1) a study website for communication, feedback, and tracking; and (2) access to an immersive virtual world (Diabetes Island) through Second Life, where a variety of diabetes self-care education activities and resources were available. Outcome measures included A1C, BMI, self-care behaviors, barriers to adherence, eating habits, empowerment, and distress. In addition, acceptability and usage were examined. A series of mixed-effects analyses, with time as a single repeated measures factor, were performed to examine preliminary outcomes. As a result, the study demonstrated promising initial results of an immersive virtual world approach to deliver diabetes self-management education. The intervention model and method show promise and could be tailored for other populations. The authors suggest a large scale controlled trial is needed to further examine efficacy.

Another article on diabetes by Thompson et al (2010) reports how behavioral science guided the design of a serious video game to prevent Type 2 diabetes and obesity among youth. The authors found that in the health promotion practice, *debriefing* can help making connections between the game and its effects. By reflecting on the game after playing it, debriefing helps the player make meaningful connections between the game experience and the “real world”. Debriefing is typically conducted after game play by asking players to respond to a series of open-ended questions that explore their perceptions toward the game. However, as the primary intent of serious video games for health is to change behavior, future research needs to explore how best to incorporate debriefing procedures into game design to enhance learning transfer from the game world to the real world (ibid: 601).

## **Serious games as pedagogical tools in nursing education: an example**

In the health care field, serious games may also have uses for other than health promotion purposes. One of them may be innovative education for health care professionals more generally. A

three-phased project is currently underway that aims to create and test a Serious Game to improve nurses' clinical reasoning and detection skills in home-care and community settings. Advances in Information and Communications Technologies (ICT) offer an opportunity to explore innovative pedagogical solutions that could help students develop these skills in a safe environment (see Petit dit Dariel et al, 2013 for more details).

The use of serious games is related to the cost effectiveness of health care. For instance, shortened hospital stays, high patient acuity and technological advances demand that nurses increasingly make decisions under conditions of uncertainty and risk. With rising trends towards out-patient care, nurses will need to perform complex problem-solving within a dynamic and changing environment. The development of sharp clinical reasoning skills, as well as skills in detection, monitoring, investigation and evaluation are therefore important. Yet few nursing students have long-term exposure to home-care and community situations in their day-to-day practice, which is primarily due to scarce human resources and the time-consuming requirements of student supervision. New pedagogical tools are needed to adequately and consistently prepare nurses for the skills they will need to care for patients outside acute care settings (ibid).

Serious games are understood here as simulation, learning and game. A pedagogical tool with a purpose offers students realistic environments where they can practice their skills anytime-anyplace. In addition, here a grounded design was required, i.e. a consistent use of chosen theories. A constructivist learning theory was employed. The components of the game involve Bloom's taxonomy: a) Knowledge – learner can recall information; b) comprehension – learner can explain and predict; c) application – learner can solve problems and use information; d) analysis – learner can see patterns and concepts and organizational structure may be understood; e) synthesis – learner can build a structure, put parts together to form a whole, with emphasis on creating a new meaning or structure; and f) evaluation – learner can compare and make judgments about the value of ideas or materials. This was combined with the Clinical Reasoning Cycle model. Best-practice guidelines outside the game were used as well to validate the students' performance (ibid).

In terms of learning outcomes more generally, several authors agree that technological advances in the future may hold further promise. When attempting to teach for transfer with a simulation, realism can greatly enhance learning and transfer. Therefore, as the screen representations become more realistic, all of the effects are likely to be enhanced (e.g. Granic et al, 2011: 78).

## **Discussion and conclusions**

One of the central purposes of games for health appears to be the increasing of motivation to improve one's health and change one's behavior towards a healthier lifestyle. The use of game techniques and mechanics are typically geared towards engaging and motivating individuals. However, applying gamification concepts and principles is challenging. Despite the growing interest, few gamification efforts have documented the challenges associated with the game development and application process (Schoech et al, 2013: 197). The fields of prevention research, computer science, gamification, and behaviour change currently do not provide sufficient guidance for developing

a strong conceptual framework to guide game design. In addition, there seems to be more written about the potential for game contexts to affect problem-solving skills than there are studies testing it.

For and against arguments have been presented regarding the benefits and harms of play, entertainment and health outcomes of serious game interventions. Whereas some emphasise the benefits of the joyful nature of play and entertainment, others see links between negative effects of playing when it occurs at the expense of, say, physical exercise. Indeed some serious games appear to combine the physical – such as rehabilitation – to games to make otherwise an activity considered as dull more interesting. Motivation plays the key role. Goodley and Runswick-Cole (2010) believe that in the case of children: when play is personally directed, it is children themselves who agree the roles or rules of the activity, as well as the outcomes, if any. The worst-case scenario might be that the behaviourist, rationalised and purposive frameworks continue to transform learning and play into joyless performance and productivity outcomes.

How much effect do the games have on health behaviour in the short and long term? One of the first meta-studies on the subject (including 54 studies) by DeSmet et al (2014) indicated that serious games may have positive effects on healthy lifestyles and their determinants, especially for knowledge and on clinical outcomes. Long-term effects apply to knowledge but not so much on behavior. Serious games were best individually tailored to both socio-demographic and change need information and benefited from a theoretical foundation in both behavioural prediction and game theories. They were effective either as a stand-alone or multi-component programme and appealed to a variety of populations regardless of age and gender.

Certain problems still remain with scientific research: lack of substantive evidence of the benefits of video games; lack of positive skills transferability to real life contexts vs the unwanted effects of shooting games transferring to real life; and that any one game may involve many elements to be considered regarding performance. Several studies suggest that especially the causal question requires more research. Stereotypes of gamers as “lonely nerds” may be misconceived; at any rate, the social benefits of cooperative versus competitive game play could be studied longitudinally, with repeated assessments, to have clearer implications for policy and practice. Nevertheless, each hour a child spends playing entertainment games is an hour not spent on homework, reading, exploring, creating, or other things that might have more educational benefit (Granic et al, 2011: 73–76).

Bandura (2004) has usefully suggested that interactive technologies are a tool, not a panacea: they cannot do much if individuals cannot motivate themselves to take advantage of what they have to offer. These systems need to be structured and designed in ways that build motivational and self-management skills. At the same time, health habits are not changed by an act of will – self management models are required. Managing health habits also involves managing social relationships and taking account the positive sides to one’s behaviour, not just targeting a specific health behavior for change. Further, the quality of health of a nation is a social matter, not just a personal one – and any stark polarization in this respect should be avoided (ibid: 150-159; see also Kato, 2010).

## References:

- Anderson, C. A., Shibuya, A., Ihori, N., Swing, E. L., Bushman, B. J., Sakamoto, A., & Saleem, M. (2010). Violent video game effects on aggression, empathy, and prosocial behavior in Eastern and Western countries: A meta-analytic review. *Psychological Bulletin* 136: 151–173.
- Bandura, A. (2004) Health promotion by social cognitive means *Health Education & Behavior* 31: 143–164.
- DeSmet, A., Van Ryckegem, D., Compernelle, S., Baranowski, T., Thompson, D., Crombez, G., Poels, K., Van Lippevelde, V., Bastiaenses, S., Van Cleemput, K., Vandebosch, H., & De Bourdeaudhuij, I. (2014) A meta-analysis of serious digital games for healthy lifestyle promotion *Preventive Medicine* (article in press)
- Ferguson, C. J. (2007). The good, the bad and the ugly: A meta-analytic review of positive and negative effects of violent video games. *Psychiatric Quarterly* 78: 309–316.
- Gentile D. A. (2011) The multiple dimensions of video game effects. *Child Development Perspectives* 5(2):75–81.
- Goodley, D. & Runswick-Cole, K. (2010) Emancipating play: Dis/abled children, development and deconstruction *Disability & Society* 25(4): 499–512.
- Granic, I., Lobel, A. & Engels, R. C.M.E. (2014) The benefits of playing video games. *American Psychologist* 69(1): 66–78.
- Hoysniemi, J. (2006) International survey on the Dance Dance Revolution game *Computers in Entertainment (CIE) - Theoretical and Practical Computer Applications in Entertainment* 4(2): April–June, 2006, Article 8.
- Kato, P.M. (2010) Video games in health care: Closing the gap. *Review of General Psychology* 14: 113–121.
- Komulainen, S. (2007) The ambiguity of the child's 'voice' in social research *Childhood* 14(1): 11–28.
- Petit dit Dariel, O. J., Raby, T., Ravaut, F. & Rothan-Tondeur, M. (2013) Developing the serious games potential in nursing education *Nurse Education Today* 33(12):1569-75.
- Ruggiero, L.; Moadsiri, A.; Quinn, L. T.; Riley, B. B.; Danielson, K.K.; Monahan, C.; Bangs, V.A.; Gerber, B.S. Diabetes Island: Preliminary Impact of a Virtual World Self-Care Educational Intervention for African Americans With Type 2 Diabetes *JMIR Serious Games* 2014 2(2):12–24.
- Schoech, D., Boyas, J.F., Black, B.M. & Elias-Lambert, N. (2013) Gamification for Behavior Change: Lessons from Developing a Social, Multiuser, Web-Tablet Based Prevention Game for Youths. *Journal of Technology in Human Services* 31(3):197–217.
- Schouten, B., Fedtke, S., Schijven, M., Vosmeer, M. & Gekker, A. (2014) Games for Health 2014. Proceedings of the 4th conference on gaming and playful interaction in healthcare Wiesbad: Springer Vieweg.
- Thompson, D., Baranowski, T., Buday, R., Baranowski, J., Thompson, V., Jago, R. & Griffith, M. J. (2010) Serious video games for health: How behavioral science guided the development of a Serious video game *Simulation & Gaming* 41(4) 587–606.

Zamboni, L., Gamberini, L., Spagnoli, A., Cipolletta, S., De Giuli, G. & Tion, I. (2011) Serious games in social intervention: Designing technologies to promote safe and healthy behaviours CHIItaly September 2011, 13–16.

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