Chapter 25

Instructional Strategies for Game-Based Learning

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ABSTRACT

Although it could be assumed that playing games lifts intrinsic motivation and that this must have an effect on the cognitive processes of the player, it is still not known how to develop an educational game with the same positive effects. Thus, the challenge for GBL is rather significant in determining how to design and develop good educational games and how to integrate them into the teaching and learning process so that students’ motivation and learning are qualitatively improved. This chapter’s main objectives are to describe some of the current GBL models proposed by the literature used to analyze, design, and integrate games in education and, on the other, to propose and describe a methodology developed by the author to create educational games. The assumption is that this type of information could aid instructional designers and educators—and even commercial game designers—interested in developing good GBL experiences.

INTRODUCTION

As in the past, there are many challenges facing education today. However, due to the current complex global state of affairs, all countries—industrialized, developing, or underdeveloped—face the central challenge of forming citizens who require novel sets of abilities to achieve more fulfilling lives. To this end, many innovations have been emerging in education, most of them integrating some use of information and communication technologies, such as MOOCs (massive open online courses), MUVES (multi-user virtual environments), virtual worlds, augmented and virtual reality, electronic games, and original online learning experiences like those offered by the Khan Academy or Codeacademy. Although there are diverse views regarding the quality of learning that these technologies have achieved, most share a fresh learning perspective: they properly presuppose an active learner. It could be argued that this assumption falls within the constructivist stance because social constructivism also assumes that knowledge is constructed during active social and situated experiences. Among these innovative instructional technologies,
one that has captured the interest of many educational practitioners and researchers around the world is game-based learning (GBL), which is the integration of educational games into the teaching and learning process. Wu, Hsiao, Wu, Lin, and Huang (2012) define GBL succinctly as “learning through the game” (p. 269). This generalized interest in the use of games by the educational community is mainly due to the strong motivational affordances that games possess to hold players’ engagement in accomplishing tasks for long periods of time (Tobias, Fletcher, & Wind, 2013). When a person is deeply involved in playing a video game for several hours, it can be assumed that that person is intrinsically motivated because he or she is mostly “doing an activity for the inherent satisfaction of the activity itself” (Ryan & Deci, 2000, p. 71). This is the kind of motivation that educators and learning designers wish for in their students because it has a positive effect on learning by promoting action in students. However, although it could be assumed that playing games lifts intrinsic motivation and that this must have an effect on the cognitive processes of the player, it is still not known how to develop an educational game with the same positive effects. It could be said that this last proposition is in part evidenced by the existence of many educational games (sometimes referred as edutainment) that do not motivate students and that are in fact, as commonly mentioned by other authors in games literature, just a chocolate-covered piece of broccoli (Farber, 2014). Thus, the challenge for GBL is rather significant in determining how to design and develop good educational games and how to integrate them into the teaching and learning process so that students’ motivation and learning are qualitatively improved.

The commercial gaming industry has been flourishing intensely for several decades, together with its methods for game design; however, when these methods are used to create educational games, authors van Staalduinen and de Freitas (2011) admit that they are not usually well integrated into pedagogical theory. In fact, Arnab et al. (2015) call this lack of integration of game and educational design as “One of the biggest issues with educational games to date” (p. 392). The issue here is that both are necessary conditions to have a good educational game: To be successful, the educational game must be capable of achieving the stated learning objectives (which often include the development of complex cognitive and behavioral abilities) as well as maintaining players’ engagement and motivation. This lack of integration is also evidenced by the educational games studies that do not explicitly state which pedagogical model they used to base their design decisions. For example, Kebritchi and Hirumi (2008) reviewed 55 educational games and found that only 24 reported in which pedagogical theory they were basing their design. Wu et al. (2012) conducted a meta-analysis study to explore how educational games were using learning theory in their analyses and found that 567 studies did not do it as opposed to 91 that did.

Thus, both frameworks—pedagogical and game design—are equally important (Rooney, 2012) because this divorce, as van Staalduinen and de Freitas (2011) put it, has important implications for the development of educational games that positively influence students’ quality of learning. However, although educational research is currently discussing how to better achieve this integration between game design and educational theory by proposing solid learning principles (e.g., Gee, 2013), both instructional designers and teachers still have many questions regarding how to create sound educational games and how to integrate them into everyday teaching contexts and practices. Many of the proposed models to develop educational games do not prescribe more specific, efficient, and low-cost development methodologies (Arnab & Clarke, 2015; Bellotti, Berta, De Gloria, D’Ursi, & Fiore, 2012). Therefore, this chapter parts from the premise that there is a need for more practical instructional strategies that could be applied to design and develop educational games.

Considering this need for innovative instructional strategies that integrate game design and pedagogy to foster better GBL practices, this chapter’s main objectives are, on the one hand, to describe some
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