Chapter 15

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 integra-
tion 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 us-
ing 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, al-
though 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 meth-
odologies (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.