

# Chapter 10

## Strategies for Effective Digital Games Development and Implementation

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### EXECUTIVE SUMMARY

*Digital technologies have increased the pace of knowledge creation, sharing, and the way in which learning is being undertaken. This chapter considers how Serious Games (SGs) as a digital technology endeavours to support effective lifelong learning. Three fundamental characteristics of the SG ecosystem, namely, game mechanics, interoperability, and assessment, are considered here as strategic elements that impact upon how SGs are to support learning, how they affect the learning environ-*

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*ment, and ultimately, the SG development process. A prospective deconstruction of SGs into its pedagogical elements and its game mechanic nodes is presented to make aware the interoperability modus from which topical (domain) frameworks or architectures can be structured and assessed. To this end, the chapter explores the conceptual underpinnings through a case study on the eAdventure platform and argues that the key elements form the foundation for strategic development and implementation of SGs.*

## **INTRODUCTION**

The expansion of technology-enhanced learning coupled with the evolution of the “NET generation” has created new opportunities for immersive and engaging game-based experiences. Serious Games (SGs) represent an enhanced technological platform for complex skills learning (Westera, 2008). The caveat however is the dependence on technology to drive the learning process rather than the learner. Simply transcribing existing material and instructional method into a SG domain can be detrimental if careful consideration is not given to the designs and approaches for learning (Dror, 2008).

Considering the SG ecosystem is a useful way of thinking about structuring a strategy for its design. Serious games are by nature complex environments that need to function perpetually as an ecological unit. The credence to a SG’s quality can be measured in terms of its fitness for purpose, utility and effectiveness. For educators SGs are increasingly viewed as an engaging technology to connect the learner. Evidence that learners seek experiential learning suggests learner-generated content to be a principle mechanism for SGs (Derryberry, 2008). That said, the use of games in formal curricula remains limited due in part to facilitator literacy, institutional infrastructure and pedagogical grounding (Zylka & Nutzinger, 2010) and time and monetary constraints of game development. Consequently, SG designers have to consider both the pedagogical practices that meet with the requirements for lifelong learning and one that demonstrates the game’s learning objectives. It is in these contexts that this chapter discusses the game-based pedagogical relationships, conflicts and contradictions that exist. Along with exposing the difficulties associated with pedagogical conformance, the authors analyze interoperability as a critical factor to a successful SG development and deployment. This chapter summarizes the characteristics of the serious games field, with special focus on two key areas: (1) the challenges faced when trying to systematize educational game design methodologies that connect learning principles with game mechanics and (2) the need for interoperable ecosystems in which games (or game patterns) can

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