Chapter 1
Game–Enhanced Learning:
Preliminary Thoughts on Curriculum Integration

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ABSTRACT

This chapter tackles the issue of Serious Games (SGs) curriculum integration approached from different perspectives (different levels, subject areas, instructional contexts, pedagogies, views, and visions over what it is already in practice and what is yet to be implemented). In light of the title of this book, it refers to Game-Enhanced Learning and not simply to game-based learning, thus supporting the concept that games can really contribute to improving and enhancing both collaborative and individual learning processes. The chapter is meant to trigger reflections on the potential of Serious Games in the present learning/teaching panorama and to explore how SGs can be considered suitable tools for sustaining the development of some relevant skills required to live and be proactive actors in the Knowledge Society, namely the so-called 21st Century Skills. Further, key challenges in the field of game-enhanced learning, with particular regard to pedagogical aspects are also in-depth explored by emphasizing the important role of teachers as to the choice of the SGs, their deployment, and the overall conduction of learning experiences.

INTRODUCTION: SERIOUS GAMES AND THE FUTURE OF LEARNING

When we speak about the Four Pillars in UNESCO's Task Force on education for the 21st Century, we are inherently speaking about learning to know, learning to do, learning to live together, and learning to be. Underpinning these pillars are the 21st Century skills that have been so hard to define and so hard to model in traditional learning conditions. However, once defined, the task of teaching all these skills to a vast array of students requires a major rethink of what education is and how it can be delivered to answer the 21stCentury challenges. This is due to the fact that today's educational infrastructure,

models and approaches are not consistent with a more skill-centred, personalized and self-paced vision for future learning. The future of learning therefore needs a consideration of 21st century skills, the future classroom *and* the best methods for educational delivery.

This rethink in education follows the need to reshape and reconsider the requirement for new competences tailored for the "generation.com" (Garris, Ahlers & Driskell, 2002) or the "new millennials". In the past, education could have simply been considered as a way to deliver a framework for prescribed educational knowledge and curriculum, in line with the classical tradition of the trivium and quadrivium. Today, the requirements of knowledge management have prescribed new sets of data and new sets of skills needed to adapt to fast changing technological advances, globalization and the need to collaborate in order to achieve goals and post-industrialism, with an emphasis upon service culture and servitisation. In the light of these changes, e-learning methods have emerged, while a parallel change in society has driven interest in social communities, game play and use of web-based services into the forefront of our work, leisure time and education, as part of this transition of technology enhanced learning into the classroom.

As a result, many of us are used to using the internet to educate ourselves, to inform ourselves, work more effectively from home and communicate with individuals and groups all over the world. Related to this, research has shown that highly interactive virtual learning imprints a permanent transformation of the educational landscape, as it has the ability to produce better academic results (Hamza-Lup & Stănescu, 2009; Wei, Lee, Hinchley, Corriveau, Kapralos & Hogue, 2010; Kapp, 2012). Moreover, the emergence of game-based learning approaches has recently found favour with learners, tutors and policy makers because games can engage and motivate learners, including those learners who are disengaged from the traditional methods of *chalk and talk* and *age and stage*.

In support of all this, Aldrich (2009) presents three arguments in favour of highly interactive virtual environments adoption:

- **Games as a learning tool:** Games are a more natural way to learn than traditional classrooms. As they are the most ancient vehicle for education, they are able to create the optimal learning state and immerse the learners into specific contexts that build knowledge and skills.
- **Context and Emotional Involvement:** Knowledge becomes entirely useful only in context. Serious games can provide the context in which the educational content can be used and also bring the learner into an emotional stake that stimulates memory.
- **Participation:** Participation with content may be necessary for learning. The process of converting experiential expertise into linear materials such as books might strip out what is most valuable in the content.

Serious Games (SGs) make learning fun, blending game elements more usually associated with entertainment games and thereby showing evidence of better retention of students on courses and higher grades. Where 'learning by doing' has become such a commonly referred practice for the proponents of Computer-Based Training (CBT), Games-Based Learning (GBL) enables both teachers and students to get a new perspective on learning, as well as enhance knowledge transfer, simultaneously offering good hands-on practice and chances for rehearsing skills and making errors without a negative consequence.

While high fidelity simulations have been the primary educational tool for decades (especially in aviation and the military), computer-based and console-based games (e.g., Xbox, Playstation) have become the focus of recent research and training because they offer an easily accessible low-cost, yet effective alternative for learning (e.g., Belanich, Sibley, & Orvis, 2004; Driskell,

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