

# Chapter 22

## Challenges of Introducing Serious Games and Virtual Worlds in Educational Curriculum

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### EXECUTIVE SUMMARY

*Although the impact that Virtual Worlds and Serious Games can have on learning efficacy and efficiency has been recognized, there is still many open questions related to this issue. Specifically there aren't guidelines or standards to help practitioners introduce this kind of technologies in a learning environment. In this chapter, the authors describe two experiments involving virtual worlds and serious games in a learning environment. These experiments allowed the authors to understand the real potential of this kind of technology, but also some of the difficulties one can come across. The authors hope that the experiments described in this chapter can serve as a basis for similar experiments done by other practitioners. Finally, some of the pitfalls that should be avoided are described as a set of lessons learnt at the end of the chapter.*

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## **INTRODUCTION**

It is unanimously acknowledged that we are living in the information age, taking part in the information society (Reigeluth 1996; Bates 1999). What makes these two emerging concepts possible is technology, or rather, the rate of progress that has been achieved in technology over the past 50 or so years (Molenda & Sullivan 2003). Throughout this period, technology has been both the generator and the transmitter of information with an increasingly faster speed and wider audience. It now dominates most facets of our lives penetrating into the conduct of normal daily life.

The field of education is not an exception in the permeation of technology. Nevertheless, the high expectations regarding the revolutionary impacts of technology on education has not yet been realized. As Bates et al. argue (1999), the current instructional technology methods are insufficient to meet the consequences of the paradigm shift from industrial age to information age. Consequently, instructional designers are faced with the challenge of forcing learning situations to fit an instructional design method rather than selecting an appropriate method to fit the needs of varying learning situations (Gustafson & Branch 2002).

These radical changes in learning and technology are fuelling a transition in modern learning in the era of the Internet, commonly referred to as e-learning. Zhang et al. (2004) explore the recent advances in e-learning technology and practice, and present experimental results that compare the effectiveness of e-learning and conventional classroom learning. Another novelty in instructional methods is the use of games. Indeed, it may possibly be wrong to call games a novelty since young children, by nature, begin to learn through games and playing since their earliest years (Rieber 1996). The use of games as a way of enhancing learning dates back to 3.000 BC where games were applied mainly to battle planning, trade accounting, fortune telling and religious divination. Although it may seem strange to look at fortune telling and religious divination as learning areas they were the equivalent to the use of mathematics and science in that era as they help people to rationalize a complex universe and to make intelligent decisions.

Recognizing the importance and the impact that Virtual Worlds and Serious Games can have on learning efficacy and efficiency we have devised two experiments in order to study the real impacts of introducing this kind of technologies in education curriculum. With this intent, two groups of studies were conducted involving teachers, psychologists and learners in an educational setting. The first involved using Virtual Worlds for distance learning and the second involved using off-the-shelf games to assess learners learning strategies profile.

The first set of studies consisted in comparing the effectiveness of learning in a Virtual World developed in INESC-ID<sup>1</sup>, the Blackboard Platform<sup>2</sup> and a traditional classroom.

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