

## Chapter 76

# Serious Games Applied to Project Management Teaching

**André Raabe**

*Universidade do Vale do Itajai, Brazil*

**Eliana Santos**

*Universidade do Vale do Itajai, Brazil*

**Lauriana Paludo**

*Universidade do Vale do Itajai, Brazil*

**Fabiane Benitti**

*Universidade do Vale do Itajai, Brazil*

### ABSTRACT

*The main focus of this chapter is to report studies that explain how to develop serious games and use them in teaching and learning. The focus has been on undergraduate teaching, experience with which the authors detail in this chapter related to the topic of Project Management. This contribution aims to share experiences and also to assess what has been done by proposing a set of recommendations for development and use of serious games in teaching practices in undergraduate education.*

### INTRODUCTION

In this chapter we present our experience from research conducted to elucidate how to develop serious games and use them in teaching and learning. Our research focus has been producing educational software to support the teaching of topics related to the formation of professionals in the area of Information Technology.

The group of researchers of the Applied Computer Science master degree program at UNIVALI has been developing and evaluating educational games (or serious games) to aid the

learning of topics related to software engineering. In former research we have produced games for themes such as:

- Life cycle models (Benitti and Molléri, 2008),
- Measurement of software quality (Wangenheim, Thiry and Kochanski, 2009), and
- Software testing (Silva, 2010; Diniz, 2010).

Our motivation for using games as educational resources consider the following aspects:

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- Students in IT typically have affinity and knowledge related to games, their rules and challenges (Phelps, Egert and Bayliss, 2009),
- Games allow to explore in classroom situations difficult to approach (budgets limits, time control, team management, etc...) (Gibson, Aldrich and Prensk, 2007);
- Games promote an increase in motivation that can foster interest by the topic under study (Lawrence, 2004), and
- Digital games allow to co-relate the subject to be taught with the game story bridging theory and praxis (Navarro and Hoek, 2005).

Summarizing, games are engaging. They motivate students using entertainment, and this is a part of the natural learning process in human development (Kim, Park and Baek, 2009).

Susi, Johannesson and Backlund (2007) found that the term “serious game” emerged from the “Serious Games Initiative” in 2002 (seriousgames.org) providing the following description of serious games: “The Serious Games Initiative is focused on uses for games in exploring management and leadership challenges facing the public sector. Part of its overall charter is to help forge productive links between the electronic game industry and projects involving the use of games in education, training, health, and public policy”. Today, in computer science, we find games for teaching contents related to different computational areas, i.e., Computing Fundamentals (Sindri, Natvig and Jahre, 2009), Programming (Muratet, 2011) and Operating System (Hill et al. 2003). In special, when we considering the use of games in Software Engineering, we find more than 20 games developed for support the teaching of different contents in this area, like Software Requirement (Smith and Gotel, 2008; Hailey et al., 2011) and Development Process (Baker, Navarro and Hoek, 2005; Ye, Liu and Polack-Wahl, 2007; Benitti, 2011). It is important to note that the initial focus

of serious games area was directed to management and leadership development and this trend remains in the Software Engineering games, as can be seen in Wangenheim and Shull (2009) and Steele (2009).

Since project management is one of the most popular areas of serious games development, we had a vast research material available. But what can we learn from what has been accomplished? How we can advance the research on serious games for project management? Trying to answer this question, this chapter presents in the section two concepts related to project management necessary to understand the research activities conducted.

## **PROJECT MANAGEMENT**

Project management is a discipline increasingly present in the curricula of educational institutions, which can be attributed to changes in behavior observed in organizations around the world, due to the growing interest in managing successful projects. As a result, many universities are incorporating this discipline in the curricula of undergraduate courses, especially in the area of information technology and graduate courses, creating specializations in Project Management for Professionals from different fields.

Manage projects corresponds to the practice of setting, planning, controlling and completing projects. A specification of a set of procedures intended to standardize the theory of project management was established by PMI (Project Management Institute), international non-profit institution bringing together professionals in project management field. The PMBOK Guide (Project Management Body Of Knowledge) (PMBOK, 2008), is the document that records this knowledge.

A Project in accordance with the PMBOK (2008), is a temporary endeavor with the goal of creating a product, service or result unique. It has well-defined beginning and end, with provisional

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