



## **STEM@School: an engaging Serious Game!**

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Over the last ten years, the way in which education and training is delivered has changed considerably with the advent of new technologies. Thus, technology should be a prominent part of the learning process and should be intended as a support for teachers and learners. One new technology that holds considerable promise for helping to engage learners is Games-Based Learning (GBL). The term game is quite ambiguous, that means that researchers, game designers, parents, students, teachers, etc. have a different concept of games. In this research, we intend games as inquiry based laboratories in which participants are able to imagine, engage with, and reflect upon their experiences. Gaming and schooling have developed into two distinct “knowledge traditions” that often rely on opposing validity criteria for determining what counts and what does not count as relevant knowledge. To avoid that dichotomy, GBL should integrate different aspects that are related to the knowledge itself, to pedagogical aspects, to scenario-based and every day practice. In the above scenario we matured the idea to develop a serious game that integrates the most up-to-date technologies in new teaching trends: Virtual Learning Environments (VLEs) and Intelligent Pedagogical Agents (IPAs). The main idea of our research is a VLE that in turn is a role playing game. The role playing game is a social game in which each student becomes a player with her abilities and her tasks. In order to succeed, all the players should work to achieve a common objective/goal. The storyboard is designed in a way that there is an evolution in the role playing game and a progress in the level of learning as well. The idea of helping students in the process of learning in a different way with respect to the classical approach finds support in many psychological studies and previous work, in particular we refer to Howard Gardner theory (1983): “We might think of the topic as a room with at least five doors or entry points into it. Students vary as to which entry point is most appropriate for them and which routes are most comfortable to follow once they have gained initial access to the room. Awareness of these entry points can help the teacher to introduce new materials in ways in which they can be easily grasped by a range of students; then, as students explore other entry points, they have the chance to develop those multiple perspectives that are the best antidote to stereotypical thinking”. In the above scenario, students face with numerous learning opportunities and therefore require intelligent support and guidance. The use of IPAs is proposed as support during the game evolution and each student has its own IPA: they act as learning facilitators and guide the learners in the virtual environment, by explaining topics, answering questions, giving feedbacks, helping the learners to collaborate with others, providing personalized learning support.