# Chapter 4.16
# Adventure Game Learning Platform

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## ABSTRACT

*Educational games display great potential as an active form of knowledge transfer. This research field is young, but some patterns in educational game development can be recognized. In this paper, the authors present a new approach to educational game development that overcomes some downsides of more traditional systems. The paper provides the opportunity to create an educational adventure game by using specialized software tool as well as integrating knowledge in that specific game instance. As a result of that process, game definition is created as a form of XML document. On the other side, a web-based interpreter is used to present the adventure game to user in runtime. XML format provides us with platform independency. By use of this tool, the educator gains the ability to create an educational game without programming knowledge, and to reuse some previously created knowledge.*

## 1. INTRODUCTION

Video game development budgets are already the size of motion picture development budgets, on the order of $20 million to $100 million, with expected revenue for a hit game reaching from $250 million to more than $1 billion (Michael, 2007).

Such fast development has allowed computer games to become more complex, more attractive, to have rich content and, at the same time, to attract more players. The popularity of computer games has made them an important part of modern society. Because of this, during the last few years, the idea of using games for educational purposes has become more and more popular.

There is also much scientific evidence that supports the claim that games can be helpful during the learning process. During research conducted in 1998. It was noticed that game playing influenced the increase in the dopamine level in organism (the substance that is in charge of memorizing chemical process). The recorded level was twice as high with game players as opposed to the control group. During the game playing, the brain was preparing for the learning process (Koepp et al., 1998).

Our interest in this area of research was triggered by students. Standard teaching methods in the age of multimedia lose their strength daily. For that specific reason we decided to experiment with educational games in order to get students more involved in course activities. We designed a pilot project for game-based learning, V-Strat (Minovic, Stavljanin, & Vico, 2007). V-Strat game logic is very similar to the logic of the old strategic game Risiko. Also, integration between education and mobile devices was an interesting topic for research (Minovic & Stavljanin, 2006). Recently, our efforts have been directed to developing a more formal approach to educational game development (Jovanovic, Starcevic, Stavljanin, & Minovic, 2008), based on our metamodel of multimodal human-computer interaction (Obrenovic & Starcevic, 2004).

This paper describes a software system that enables the creation of educational games. The idea that separates this software from others is a new approach to educational game defining. By separating the roles of game designer and knowledge expert we provide the ability, for both participants in the game creation process, to perform only the activities within their own specialty. The system consists of three parts: knowledge repository, game editor and web – based game interpreter. Learning objects, which are stored in the data repository, represent knowledge. Game editor is used for defining the game world, rules, scenarios, interactions between players and characters, as well as incorporating knowledge into

the game. Game interpreter presents the game to a user, creates game interface and monitors communication between the game and the user. Game editor creates a special XML file which contains the game definition and the knowledge definition. The XML file is then used by the game interpreter to create a game instance.

Paper structure: in the second part, we a give brief explanation of term e-Learning. The third part give basic information about the game-based learning. Next, we define the problem statement. The fifth part gives a short bibliography review. The sixth part presents our solution proposal. Next we give XML scheme for adventure educational game explained in more details, and after that short comparison of existing solutions and proposed solution. The conclusion is given at the end of the paper.

## 2. E-LEARNING

The term e-learning is more and more in use and it means using modern information and communication technologies in the learning process. During the 80's e-learning was only „computer-based training" and „computer-assisted instruction". But technological progress has given another dimension to the learning process. Today learning has been made possible regardless of time and place. The latest development enables learning on mobile technology.

E-learning is every aspect of learning using electronic media. This type of learning uses network for interaction. This network can be Internet, university network or any other computer network. E-learning has several types of patterns. It can be individual or group. Group can be synchrony, asynchrony and combined.

E-learning, therefore, is an approach to facilitate and enhance learning through both computer and communications technology. Such devices can include personal computers, CDROMs, Television, PDAs, MP3 Players, and Mobile Phones.

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