Chapter 12
Online Multiplayer Games: A Powerful Tool for Learning Communication and Teamwork

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ABSTRACT

*This chapter describes an online video teleconferencing tool the authors have created that allows learners to collaborate, negotiate, discuss, share ideas and emotions, and establish relationships while engaged in educational games and simulations. The ENJEUX-S (L'***En***vironnement multimédia évolué de* **JEUX** *éducatifs et de Simulations en ligne) multimedia environment relies on Web Services for the management and operation of online games and simulations and on real-time communication services (audio- and video-conferencing, chat) to support a collaborative working environment for players. The authors first describe the components of ENJEUX-S, their technological choices, and the environment's architecture. Then, they present the results of ENJEUX-S testing to correct problems and measure ease of use and functionality for target users. Finally, they outline the pedagogical contributions of such an environment in the context of online games and simulations, notably to development of interpersonal competencies including cooperation, communication, and teamwork.*

INTRODUCTION

Many recent studies have concluded that educational games and simulations develop a learner's capacity to establish relationships with others, negotiate, discuss, collaborate, share emotions and ideas, establish ties and friendships, and work in teams putting together ideas and resources (Sauvé, Renaud, Kaufman, & Sibomana, 2008b). The group becomes a place in which the learner identifies himself as belonging, where experience is shared, and learning is achieved.

At the same time, recent advances in synchronous technologies on the Internet now permit us to link

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together individuals, in real time, wherever they are and whatever the time zone. These technologies not only abolish the physical borders of space and time, but they create new realities (Probst, Villardier, & Sauvé, 2004) embodied in virtual worlds, where entire communities can communicate and exchange among themselves. This is a relatively new way of life (Villardier et al., 2006), spreading with the arrival of new direct communication technologies and taking an ever-larger place in our daily activities.

To achieve these communication dynamics, advanced educational game and virtual simulation environments must meet certain criteria; supporting direct communication and consultation, quick exchanges between team members, decision-making that incorporates the dynamics of interpersonal exchanges, spontaneous dialogue, instantaneous action, and, as far as possible, respect for confidentiality. The architecture of these environments must also conform to certain quality of service (QoS) requirements, including: flexibility, user friendliness, portability, interoperability, reliability and robustness.

It is in this context that an applied research project was financed by Canada's CANARIE Inc. (Canadian Advanced Network And Research for Industry and Education), with the objective of developing an environment based on a Web Services and telecommunications architecture, in order to support development and research activities related to generic game and simulation shells for the *Simulation and Advanced Gaming Environments (SAGE) for Learning* project and the *Carrefour de jeux éducatifs/ Educational Games Central* online portal (http://egc.savie.ca). This video teleconferencing environment was designed to support multi-user functions while offering transactional and interpersonal interactivity.

This chapter reports the results of this development effort. We first describe the components of *ENJEUX-S* (L'**En**vironnement multimédia évolué de **JEUX** éducatifs et de Simulations en ligne), a real-time multimedia environment for online games and simulations. We next explain the environment's architecture and technological choices. We then describe the *ENJEUX-S* testing, which allowed the detection and correction of bugs and technical problems as well as measurement of its user-friendliness and usefulness with a target group. Finally, we outline the contributions of such an environment in the context of online games and simulations to the development of interpersonal competencies, notably cooperation and collaboration, communication and teamwork.

AN ADVANCED ENVIRONMENT FOR EDUCATIONAL GAMES AND SIMULATIONS

ENJEUX-S is part of the continuing efforts of the Canadian *SAGE* research network (www.sageforlearning.ca or www.apprentissage-jes.ca). Its development has permitted the network to increase its real-time communication and interaction in online meetings and in the use of games and simulations. *ENJEUX-S* has integrated real-time communication components (audio, video, chat, white board, application sharing, and online access management) and multiple workstations into games developed with five generic educational game shells for the *Carrefour de jeu éducatifs/ Educational Game Central* online community (Sauvé, 2005) and two new shells, one for *Parcheesi*™ (Sauvé, 2006), and one for problem-based learning simulations (*COMPSoft). (*These shells are described in more detail in Section IV and Chapter 17 of this volume, respectively.) Introducing telepresence into the universe of educational games on the Internet, *ENJEUX-S* allows us to exploit enriched educational situations incorporating feedback, direct dialogue, immediate assistance, shared strategies, help, etc. (Sauvé et al., 2005). With *ENJEUX–S* the real world merges with the virtual world.

The user interface[1] of the *ENJEUX-S* environment consists of three spaces and a control