Chapter 3.13
An Extendible Simulation Game to Promote Team Spirit on Mobile Computing Devices

Vincent Tam
The University of Hong Kong, Hong Kong

Lawrence Yeung
The University of Hong Kong, Hong Kong

Zexian Liao
The University of Hong Kong, Hong Kong

A.C.M. Kwan
The University of Hong Kong, Hong Kong

C.H. Leung
The University of Hong Kong, Hong Kong

ABSTRACT

Game based learning (GBL) has significantly reshaped the latest educational or training technologies through engaging players in many carefully planned learning activities in real-world applications including the training of tactic planning in a simulated combat environment, or resource management for any large organization. Successful examples range from the commercially available simulation games like SimBusiness, being adopted in some business schools in North America, to Quest Atlantis as a 3D multi-user learning game platform to children aged 9 – 15 in meaningful inquiry tasks. In a previous Teaching Development Project, the authors of this chapter developed an interesting simulation game platform for a virtual university campus containing game rooms with different missions for students to fulfill so as to enhance the learners' experience after classes on ubiquitous computing devices. All the missions are focused on engaging players to exercise their logical thinking or problem-solving skills in relevant areas of Information and Communication Technologies (ICT). To promote team spirit, each group of 3 to 4 students will work together to complete all the missions within the virtual campus. The authors used the open-source Nebula Version 2.0 toolkit to build a prototype of our simulation game containing various game rooms inside a virtual campus that can be accessed through any Windows based desktop or pocket PCs. To allow the real-time chatting facility among team members, the Yet Another Telephony Engine (YATE) server is employed in the interactive game platform. A preliminary evaluation was conducted to analyze the effectiveness of the simulation game on motivating and/or enhancing the learners' experience in relevant disciplines. All in all, there are many interesting directions for further investigations including the integration of our simulation game with existing learning management system or increasing players' involvement in proposing new missions.

1. INTRODUCTION

Game based learning (GBL) (Prensky, 2002) has significantly reshaped the latest educational or training technologies through engaging players in many carefully planned learning activities in real-world applications including the training of tactic planning in a simulated combat environment, or resource management for any large organization. In addition to such specific training, there are numerous successful examples of commercially developed simulation games including SimCity (SimCity, 2007) or Sims™ 2 Open for Business (SimBusiness, 2007), originally developed for fun and later seriously used by the business schools of various universities in North America to motivate or sustain the students' learning interests in their specialized fields. In many cases, it was shown that the appropriate use of simulation games not only avoids the indispensable costs of human lives or money lost in the hostile combat or investment field, but also effectively motivates and/or raises the learners' interests that may have positive impacts on their actual performance attained in handling the real-world situation, thus reaffirming the important value of simulation in training or education in general. As clearly described in Wikipedia (2007), "Simulation is used in many contexts, including the modeling of natural systems or human systems in order to gain insight into their functioning. Other contexts include simulation of technology for performance optimization, safety engineering, testing, training and education". In many such applications, simulation can be used to demonstrate the eventual effects of alternative conditions and course of actions.

In general, the use of interactive simulation tools can help students better understand the underlying working principles of many biological or physical systems, and therefore motivates the learners' interests for further investigation that may lead to enhanced performance in the concerned subject. For instance, a computer-aided simulation game named "The Incredible Machine" (Ward &

Carroll, 1998) was found to enhance the mechanical reasoning capabilities of transition year students, including 17 females and 27 males with their age between 15 and 16 years, to a certain extent in an exploratory study conducted in a vocational school in Ireland. The study strictly followed the pre-test/post-test control group design, with the students' mechanical reasoning skills evaluated by the Differential Aptitude Test for Guidance. There were significant differences in favor of male students in the experimental group with training using "The Incredible Machine" simulation game as shown in the t-test analysis of their pre-test and post-test raw scores. Furthermore, there are various successful applications of simulation tools or games in other sectors of education (Kent NGfL, 2007; SCS, 2007; SuperKids, 2007).

In Hong Kong, where commercial and financial activities are overwhelmingly active in recent years with a lack of long-term development infrastructure for Engineering related disciplines, many tertiary educators in Engineering are faced with the core problems of motivating the students' learning interests and more importantly helping students realize the real values of the professional training in their own specific field. Therefore, in a Teaching Development Project, we proposed to develop an interesting simulation game inside a virtual university campus containing game rooms with different missions for students to fulfill on ubiquitous devices so as to enhance their learning experience after classes. All the missions are focused on engaging players to exercise their logical thinking or problem-solving skills relevant to specific disciplines of Engineering in a virtual environment without the limitation of many physical factors. For example, the Electronic and Communications Engineering students need not to worry about damaging several digital circuit boards before successfully building a working digital device such as a digital computer or network modem. To promote the spirit of teamwork (Ward & Carroll, 1998), each team of 3 to 4 students will work together to complete all the missions within

12 more pages are available in the full version of this document, which may be purchased using the "Add to Cart" button on the publisher's webpage: www.igi-global.com/chapter/extendible-simulation-game-promote-team/63154

Related Content

A Flipped Classroom: Learning Experiences in Programming
Su Ting Yong, Kung Ming Tiong, Andy Chanand Poi Sim Khiew (2021). *International Journal of Virtual and Personal Learning Environments (pp. 23-37).*
www.irma-international.org/article/a-flipped-classroom/267975

Challenges Facing the Semantic Web and Social Software as Communication Technology Agents in E-Learning Environments
Bolanle A. Olaniran (2010). *International Journal of Virtual and Personal Learning Environments (pp. 18-30).*
www.irma-international.org/article/challenges-facing-semantic-web-social/48219

Facilitating Civility in Distance Education
Catherine F. Flynn (2020). *Socioeconomics, Diversity, and the Politics of Online Education (pp. 1-16).*
www.irma-international.org/chapter/facilitating-civility-in-distance-education/259094

Using a Learning Management System to Facilitate Learning Outcomes Assessment
Steven F. Telloand Luvai Motiwalla (2012). *Virtual Learning Environments: Concepts, Methodologies, Tools and Applications (pp. 1132-1150).*
www.irma-international.org/chapter/using-learning-management-system-facilitate/63183

Social Presence in Virtual World Interviews
Elizabeth Dean, Joe Murphyand Sarah Cook (2013). *Serious Games and Virtual Worlds in Education, Professional Development, and Healthcare (pp. 117-125).*
www.irma-international.org/chapter/social-presence-virtual-world-interviews/75811