Chapter 59

Harnessing and Evaluating Open Sim for the Implementation of an Inquiry–Based Collaborative Learning (Ib[C]L) Script in Computer Science:
Preliminary Findings from a Case Study in Higher Education

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ABSTRACT

From 2007 and now on, it is a common premise for scholars and educators to use multi-user virtual worlds (VWs) in order to enhance students' technological literacy with contemporary learning strategies. The corollary of interactivity and social formalization of modeling processes in an open source, server-based (standalone) virtual environment is a unique dimension that allows all users (students and instructor) to design a plethora learning activities in conjunction with the most contemporary pedagogical approaches. Accordingly to these provisions, this study focused on the implementation of a collaborative project-based course in computer science by taking advantage of the open source virtual world Open Simulator (Open Sim). The current case study seeks to present preliminary findings from collaborative experiences of an effort that thirty-five (35) postgraduate and undergraduate students participated with the hybrid instructional format in order to investigate the value of this effort for learning introductory programming lessons. This effort tries to articulate initial perceptions of students' assessments based on an inquiry-based collaborative learning (IB[C]L) script that they involved, and secondarily to demonstrate the multisensory-multimodal potential perspectives or educational implications that are being emerged from the exploitation of three-dimensional (3D) technologically-advanced environments.

INTRODUCTION

Computer Science courses in Higher education have received severe criticism because are based on the utilization of two-dimensional (2D) learning platforms and in oral-based teaching methods. Beyond that hybrid course delivery method is used on these platforms, it is lacking the real time feedback from the instructor to his/her students and thence opportunities are limiting for meaningful or purposeful collaborative activities between distributed users (Berns, Gonzalez-Pardo & Camacho, 2013; Lau & Yuen, 2009; Sun et al., 2008). This procedure has led students to become passive receivers of information and this obviously can be provoked from an overloaded theoretical content that is emerging and it is impossible to be digested or practically applied in innovative learning environments via a typical computer laboratory.

Many curricula internationally have consistent with the didactic models which are necessary for teaching different fields even for the professional preparation of students who enrolled in Computer Science courses. During this operation and based on the conventional teaching methods, it became a rigorous problem to fill the gap between the theory transaction of the dimension between what the theory defines and what in practice-applied computing programming commands at an introductory-level students understand in project-based procedures and how can this process motivate them to cooperatively learn with others. At the same time the rapid changes in 2D or three-dimensional (3D) systems have provided learning materials and occurred on a global level as the most appropriate for the acquisition of programming commands in learning environments. Two main categories of these environments that currently being used for programming courses are those of 2D [Asynchronous] Learning Management Systems ([A]LMS) (Addison, 2011; Kris et al., 2010) and these 3D (multi-user) of virtual worlds (VWs) (Esteves et al., 2010; Pellas, Peroutseas & Kazanidis, 2013),

with the latter category to be the most prominent for various educational processes.

All the above have established a novel dialogue in the Computer Science community on how to enable better the Information, Communication and Technologies (ICT) transactions in order to meet new requirements that modern curricula of the 21st century predominantly require. Innovative learning activities by exploiting sources of the Web 2.0 and mostly those that endorse 3D interactive technology have already appeared in different university-level disciplines and have equally unveiled not only valuable impressions to users, but also conspicuous promises for the future.

For almost seven years, many researchers and scholars (Lee, Wong, & Fung, 2010; Pellas, Peroutseas & Kazanidis, 2013; Roussou et al., 2006; Winn, Windschitl, Fruland, & Lee, 2002) have already used the 3D interactive technology because its features can be combined adequately with the students' prior experiences in order to be constructed a truly novel platform for enhancing their technological literacy.

Although, a VW is not always being used for educational purposes per se, but with the proper configuration and (co-)manipulation from the same users by utilizing server-based visual tools or artifacts, it can become a reliable training platform where instructors and students (users) can efficiently utilize for learning with the most eligible instructional formats (online/blended). Similarly noteworthy, the explosive growth of the "blogosphere" and Web 2.0 seems to enunciate the users' needs or demands and thus VWs are proposed to support learning activities where students have the opportunity:

- To develop skills or implementing collaborative scenarios (Franceschi et al., 2008); and
- To perform in a particular activity as a part of a larger community in which they have to share common goals in a virtual place (McArdle et al., 2004).

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