

Chapter XV

An Integrated Platform for Educational Virtual Environments

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Abstract

In this chapter, we present the design and implementation of an integrated platform for Educational Virtual Environments. This platform aims to support an educational community, synchronous online courses in multi-user three-dimensional (3D) environments, and the creation and access of asynchronous courses through a learning content management system. In order to offer synchronous courses, we have implemented

a system called EVE-II, which supports stable event sharing for multi-user 3D places, easy creation of multi-user 3D places, H.323-based voice- over IP services fully integrated in a 3D space, as well as many concurrent 3D multi-user spaces.

Introduction

The formation of communities among individuals who shared common characteristics goes along with the evolution and socialization of the mankind. This inherent need for communication and collaboration, in combination with the swift growth of the technology, resulted in the development of services that could meet the above-mentioned needs. In particular, the maturation of the Internet services and the melioration of the network bandwidth, along with the users' familiarization with the powerful means of distant communication and collaboration, formed the basis for the widespread establishment of online communities. These communities are described by the term "virtual communities" in order to define their "online" substance.

The definition of a virtual community is comprised of the following fundamental characteristics: (a) people who want to interact socially to satisfy needs, perform roles, and so forth; (b) a shared purpose, which provides a reason for the community; (c) policies, which guide human interaction; and (d) computer systems to support and mediate social interaction. These basic characteristics define the framework as well as the context of the constituted communities and entitle the scope, the concepts, and the intended milestones. In particular, in the case where the shared purpose of these virtual communities is learning, we address them as virtual learning communities.

Currently, the need for a paradigm change in e-learning has been identified, but which has not yet taken place (Laister & Koubek, 2001). In the past, Information and Communication Technologies (ICT) have been developed in a technology-centered way, but we are currently undergoing a change towards more human-centered concepts of using information technology for business, learning, and communicating with each other. However, Resource-Based Learning (RBL), which focuses on the interaction between human and computer, still prevails. Although, the RBL approach has several advantages for supporting individual learning by providing interactive, media-rich resources for learning, several disadvantages have been identified. Some of these disadvantages involve the lack of peer contact and interaction of students working alone, and the need for flexible, available tutorial support. Moreover, interactive distributed learning facilitates the acquisition of a higher level of understanding by the students than passive distributed learning, thus enabling the learning process to be more active and more explorative.

It becomes clear that the key concept of learning, which qualifies a virtual learning community, requires a balanced combination of technology with the human factor. Therefore, a virtual community should be supported by a computer system that should be able to facilitate delivery of e-learning content, collaboration, and distance learning services, both in the industrial and the educational field. We address such an educational technology system as an Educational Virtual Environment.

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