

Chapter 4

EduTutor: An Intelligent Tutor System for a Learning Management System

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ABSTRACT

Intelligent tutoring systems are any computer systems encompassing interactive applications with some intelligence that support and facilitate the teaching-learning process. The intelligence of these systems is the ability to adapt to each student throughout his/her learning process. This paper presents an intelligent tutoring system, called EduTutor, created for the web-based Aulanet learning management system (LMS).

The system architecture and its main characteristics are described in detail. EduTutor focuses on subjects for the first cycle of studies of the Portuguese primary education system, between the first and the fourth year. Its purpose is to facilitate the perception of the learning process of each student, individually, in a virtual environment, and as a study guide. Furthermore, this intelligent tutor system was designed and its architecture was prepared for being easily integrated in higher levels of studies, different subjects, and different languages. EduTutor was validated with a large set of real cases and is being used, with success, in the Aulanet LMS platform.

INTRODUCTION

Nowadays the teaching-learning process is being more supported by technological resources that offer different ways of communication between

persons, using sophisticated educational software applications.

Distance learning is based on an educational model in which teachers and students are physically present at the same place. In this context, they exchange learning contents using information

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and communication technologies. In the past few decades, distance learning started to be important by the policies defined by the governments of the most developed countries. Furthermore, both companies and other organizations paid more attention to these technologies because they allow easy information access in asynchronous way. Older examples of this kind of learning were the tele-school and teaching by mail. Nowadays, with the fast spreading of the Internet, these methods have been discarded and are being replaced by e-learning.

E-learning term is usually understood as electronic learning or learning through computer (Amaral & Leal, 2006). These authors conclude their work with a formal definition of e-learning. In this manner, e-learning is defined by “The process, by which the student learns through the content placed in the Internet and/or CD-Rom. The teacher, if exists, is at distance, using the Internet to communicate (synchronously or asynchronously) with the students, possibly intermediated with some face-to-face moments” (Amaral & Leal, 2006).

It is important to guarantee that e-learning is not just one more tool for non-organized information delivery. Based on this, it is crucial to recognize the importance of the distance learning methodologies. In this sense, the existence of systems that monitor the progress of learning of individual students in virtual learning environments is essential. We may consider the following five types of e-learning, based on (Amaral & Leal, 2007): (i) asynchronous online teaching, (ii) on-line teaching with synchronous moments, (iii) mixed on-line teaching, (iv) (pure) on-line teaching, and (v) computer based teaching.

Asynchronous online teaching is characterized by a teacher-student interaction with asynchronous moments, such as electronic mail exchange or discussion fora. Whereas in the online teaching with synchronous moments, teacher-student interaction needs synchronous moments, such as Internet relay chat (IRC) and videoconference. Mixed online teaching involves real-time and

face-to-face interaction, and it is also known as blended learning. In the pure online teaching, contents are available on the Internet without the teacher’s figure and it is not dependent on the time and space. Finally, in the computer based teaching, contents are available on CD and, similarly to the latter, with teacher support. In this kind of e-learning, the contents are independent of time and space.

Under e-learning, the following two main concepts or technological systems may be considered (Yuuichi, Toshihiro, Seisuke, & Hiroshi, 2006): learning management systems (LMS) and course management system (CMS). Now the question is “What is the real difference between CMSs (such as Blackboard (Blackboard Inc., 2008), and LMSs (such as NetDimensions EKP (NetDimensions, 2008), Saba (Saba, 2008), or SumTotal (SumTotal Systems, 2008)?” The answer to this question is the basis to understand the difference between the concepts CMS and LMS.

A CMS is characterized by online systems that were originally designed to support academic learning, such as universities or secondary schools. Traditionally, a CMS is defined as a web-based software that creates and distributes course content, manages student enrollment and tracks student performance. In this sense, the CMS enables instructors to extend the classroom beyond its traditional boundaries of time and space. With the advent of digital libraries and Web 2.0 technologies, the term CMS is being replaced by LMS. This term extends the previous CMS concept to include tools that allow easy access to digital resources and enable a wide range of collaborative activities. So, LMS is a software application or Web-based technology used to plan, implement, and assess a specific learning process. Typically, a LMS provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance. It may also confer students the ability to use interactive features such as threaded discussions, videoconferencing, and discussion *fora*.

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