

Preface

E-Learning plays a significant role in education, and its importance increases day by day. Learning environments can take a myriad of distinct forms. Learning Management Systems (LMS) emerge as an important platform to support effective learning environments. According to Wang and Chen (2009), “an LMS employs a range of information and communication technologies to offer an online platform over the Internet, where a whole course can be planned, facilitated and managed by both the teacher and the learner”. In their work it is presented the main functions of some of the LMS nowadays available for educational purposes such as: learning material management, discussion forums, group emailing, audio conferencing, video conferencing, text chat, and whiteboard and synchronous document sharing. For Watson and Watson (2007), the term LMS is used to describe different educational computer applications. LMS is the framework that holds all sides of the learning process, including skills gap analysis. It is responsible to deliver and manage the infrastructural content, to identify and assess individual and organizational learning or training goals, to follow the process in order to reach those goals, and to collect and present data for supervising the learning process of an organization as a whole. With the rising of Web 2.0 and Web 3.0, learning environments are also overflowing Learning Management Systems and Institutions’ boundaries.

Learning Management Systems are used all over Higher Education Institutions (HEI) and the need to know and understand its adoption and usage arises. On the one hand, there are different institutional cultures and characteristics and, on the other hand, there are several distinct LMS tools. Considering this it is expected to find out distinct experiences in the adoption and usage of LMS. The richness of each of the experiences can help the worldwide community to better understand how LMS are being used. The most used LMS according to a survey (Babo & Azevedo, 2009) answered by 51 universities from 19 different countries in 5 continents, were Moodle (Moodle, 2009), Blackboard / WebCT (Blackboard, 2009), and Sakay (Sakay Project, 2009). In that study several other LMS were referred such as ItsLearning, Desire2Learn, Claroline, METU Online, Chisimba, High Learn, Formare, Learning Space, First Class, Dokeos, eCollege, Class Fronter, KEWL. The results can be seen as an evolution. In the past years, the proprietary platforms were the most used but currently there is an increase of open source free platforms usage (Bradley *et al.*, 2007). Consequently, there are not many studies regarding the usage level of such tools, concerning students, teachers, tools functionalities, usability, and the entire technological environment. Generally, both proprietary and open source free LMS provide several functionalities, such as, electronic distribution of course syllabi, grades and teachers feedback to students, ability to post hyperlinks to websites, forum for the exchange of ideas, wikis which allows students to swap ideas and information on projects, chat rooms for real time discussion, facilitating emailing and

messaging among the participants (teacher/students, students/students), facilities for students to submit work assignments electronically, the means to administer quizzes and texts online (Janossy, 2008). It is frequent to observe that despite LMS on HEI is offered and usage stimulated, only a few of those functionalities are adopted, either by teachers, or by students.

LMS are a powerful technology that has not achieved its full potential yet. As far as we know, understanding the actual aspects of LMS usage in HEI is an issue that is not sufficiently explored on research. Consequently, this is an interesting aspect to be explored and studied. The primary objective of this book is to provide insights concerning Learning Management Systems on Higher Education Institutions. The book aims to increase understanding of LMS adoption and usage providing relevant academic work, empirical research findings and an overview of LMS usage on Higher Education Institutions all over the world.

The target audience of this book is composed of Education government members, Higher Education Managers, researchers, academicians, practitioners and graduate students in every field of study. LMS are not limited to a specific academic area being a trend and a new learning approach in any scientific field.

BOOK STRUCTURE

This book includes fifteen chapters divided into four sections, namely, LMS Generalities and Perspectives, Implementing and Evaluating, Trends and Challenges, and Case Studies.

It counted with the collaboration of researchers from 40 different universities and companies from 35 countries. Despite of the overall quality of the received proposals it was not possible to include all of them.

As editors and after serious consideration during the review process, supported by our reviewers' team and by the Editorial Advisory Board, we chose the best chapters in order to achieve the proposed goals of this book and those chapters which better fits the main focus of the book.

In the first section Generalities and Perspectives Robert Folden very well understood the need of a general view of all the aspects related with the Learning Management System issue. One of the problems with much of the Scientific Literature is the assumption that all readers have the same background of the writers. This author very well assumes that is rarely true presenting the readers with the necessary foundations to go further in the field to be studied in depth. This is the chapter that any editor would appreciate to open with a book.

Chapter 2 lies upon the premise of the asynchrony of the learning and knowledge sharing process which is a "human-to-human process that happen independent of time and space".

A reflection is presented towards "social awareness to determine the appropriateness of a LMS tool" considering asynchrony and ubiquity through all the process. Uncommonly a social concerning contributes from a technological university author. Both chapters are an excellent treatise of LMS in education.

In the line of the two previous chapters, Chapter 3 provide us with an insight of the Distance Education evolution and the evaluation of the use of web 2.0 technologies offered by a chosen LMS in an educational context. Furthermore an interesting case study was developed by University of the west of Scotland and hereby presented. The use of e-learning in vocational courses is well explored in this chapter.

Adoption and evaluation are two important and related issues regarding LMS that are presented in section 2. LMS store users' logs in specific internal databases. These logs contain an immeasurable

wealth that can and should be used to evaluate LMS usage, in order to help Higher Education decision makers to take better decisions regarding LMS policies. Paul LAM, Judy LO, Jack LEE, and Carmel NAUGHT present, in chapter 4, an interesting study developed in the Chinese University of Hong Kong. The study took place during three years, between 2007 and 2009. The authors define three levels of analysis for the e-Learning activities, namely Popularity, Nature, and Engagement. Using these levels, it was possible to become aware of the different types of LMS usage and to define strategies in order to align its usage with the policies of the institution for e-Learning. Also using users' logs analysis, but with a different even still very interesting perspective, Tyler Swanger, Kaitlyn Whitlock, Anthony Scime, and Brendan Post study, developed in The College at Brockport, State University of New York, is presented in chapter 5. The study was developed during the academic years of 2007 and 2008. Three data mining tasks, namely classification, clustering, and association, are implemented in order to extract useful knowledge and to obtain meaningful insights on LMS evaluation. This chapter refers to a new and interesting data mining application. In chapter 6, Kamla Ali Al-Busaidi, and Hafedh Al-Shihi present a model that intend to explain instructors' acceptance of LMS. Despite that LMS usage depends on both students and instructs, it is up to the instructor to start the process and thus it is fundamental to understand which factors affect instructors' acceptance and consequent use of LMS. The presented model is a valuable contribution in this direction.

LMS usage in higher education is gaining momentum each day. As a consequence, new trends and challenges arise. In section 3, these issues are explored. José Paulo Leal & Ricardo Queirós explore, in chapter 7, some issues concerning LMS interoperability. In order to analyze and compare some of LMS interoperability features, a framework was developed and tested using Moodle and Blackboard. The framework defines two facets for LMS interoperability, exploring the main related issues in a stimulating, methodical, and efficient manner. Chapter 8 focuses on the use of mobile devices to access LMS supported courses. Demetrios Sampson & Panagios Zervas present a device developed in order to allow the deployment of LMS courses through online devices. This is advantageously achieved by means of the implementation and validation of a mobile version of Moodle that conforms to guidelines proposed by the World Wide Web Consortium. In chapter 9, Dimos Triantis & Errikos Ventouras contribute with the presentation of an interesting grading scheme applied in multiple-choice questionnaires. The presented grading scheme intends to prevent students from guessing the correct answers and thus develop a fair grading system. The proposed methodology is compared with more traditional ones in a real situation, bringing good insights to this issue. In chapter 10, the important theme of LMS accessibility is introduced. Lourdes Moreno, Ana Iglesias, Rocio Calvo, Nuno Delgado, & Luis Zaragoza, evaluated Moodle LMS, studying in detail accessibility concerns regarding visually impaired users. A new method was developed that leads to a better perceptiveness, which can conduct to the definition of better policies and practices. Dorota Dzega & Wieslaw Pietruszkiewicz presents, in chapter 11, a new technological solution designed to address some specific necessities of a higher education institution. Those necessities are also general necessities of a vast majority of higher education institutions. The referred solution is presented as an innovative extension of Moodle LMS, and consists of a new layer in the eLearning platform, offering additional advantages.

The case Study section presents four case studies among Portuguese, Spanish, Italian and German universities. While the first three chapters present deep case studies whose main concern is the better understanding how LMS are being used, the German case study focuses in adoption strategies for LMS.

Chapter 12 characterizes the students Internet Usage and their LMS usage patterns in a Portuguese University. Chapters 13 and 14 case studies present long-lasting experiments and observation made in Spanish and in an Italian Universities. Chapter 13 presents the effort made by Genova University over the last 10 years in order to adopt “ICT educational support”. Next chapter relates the adoption of an e-learning system which involved new teaching strategies and take into consideration student’s workload.

The last chapter discusses the taken approaches – Top-Down or Bottom-up- of three German universities regarding the LMS implementation process. Not all the universities have had the same approach. Nevertheless the overall goals were achieved.

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