IMPORTANCE OF IMPLEMENTING OPTIMAL LEARNING MANAGEMENT SYSTEMS FOR E-LEARNING IN HIGHER EDUCATION

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Over the last few years online education has shown a significant boom in Higher Education Institutions. Every day more and more universities are implementing their educational programs through this mode, offering opportunities for those people who cannot carry out their studies face to face. This educational mode offers a series of advantages, to highlight some of them for example, access to materials and content at any time and at any place, all that is needed is a computer and a connection to Internet; the students have an active role in their process of learning, meaning that they are not restricted recipients of information, but that it is part of their formative process; there is an authentic management of knowledge among students (exchange of ideas, opinions, practices, experiences); and feedback.

Derived from the above, the number of students who carry out their studies under this educational mode has increased significantly, generating in Higher Education Institutions the need to acquire the appropriate technological infrastructure and the implementation of the most suitable Learning Management Systems (LMS) to fulfill the academic needs in this mode.

In this sense, this research paper a comparative analysis is carried out between learning management systems with private software (Blackboard y WebCT) and of open source software (Moodle, Dokeos and Claroline). The parameters for comparison employed in this research, are the installation, personalization of the environment, functionality, resources management, groups and profiles, functionalities of Web 2.0 and the management of courses, in order to determine the optimum informatics solution for the implementation of educational programs in the mode of online education at the Computer Science Faculty of Mazatlan at the Autonomous University of Sinaloa.

After the analysis of different solutions, it’s important to find the effects of how the correct selection of a learning management system make an impact in the academic performance of students, comparing, the needs of student use, the ease of the user interface, management, design, etc.

Keywords: distance education, learning management systems, open source software, exclusive software, higher education.
IMPORTANCE OF IMPLEMENTING OPTIMAL LEARNING MANAGEMENT SYSTEMS FOR E LEARNING IN HIGHER EDUCATION

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Abstract

Over the last few years online education has shown a significant boom in Higher Education Institutions. Every day more and more universities are implementing their educational programs through this mode, offering opportunities for those people who cannot carry out their studies face to face. This educational mode offers a series of advantages, to highlight some of them for example, access to materials and content at any time and at any place, all that is needed is a computer and an Internet connection; the students have an active role in their process of learning, meaning that they are not restricted recipients of information, but that it is part of their formative process; there is an authentic management of knowledge among students (exchange of ideas, opinions, practices, experiences); and feedback.

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Keywords: Distance Education, Learning Management Systems, Open Source Software, Exclusive Software, Higher Education.

1 INTRODUCTION

This research analyzes issues of critical importance to the continued acceptance of academic models based on distance and online modality.

In recent years this acceptance has increased on a large scale because society is somehow watching online education as an option for academic learning ever more with solid bases compared to its beginnings in the 70s.

One of the essential bases of online education is the perfect operation of the used medium to make come instruction to students making use of information technology, for which involves many technological aspects as internet connectivity, server processing capacity, backup systems, user interface design and the Learning Management System by the LMS acronym according to Rouse M. (2005) [1] “is a software application or Web-based technology used to plan, implement, and assess a
specific learning process. Typically, a learning management system provides an instructor with a way to create and deliver content, monitor student participation, and assess student performance. A learning management system may also provide students with the ability to use interactive features such as threaded discussions, video conferencing, and discussion forums.

Boneu also points out that any learning management system should present four characteristics that are basic and indispensable [2], which are:

- **Interactivity**: capability to achieve that the person who is using the platform be aware that he has the leading role in his learning.
- **Flexibility**: set of functions that allow for the system to adapt easily to the institution where it is to be implanted.
- **Scalability**: capabilities allowing the system to function equally with a small or large number of users.
- **Standardization**: refers to the possibility to utilize courses created by a third party; in this way, the course are available for the institution which has created them and for others which meet the standard.

On this way, the following research exposes the importance to implement the correct LMS selection as well as technological and design aspects that must cover for academic program acceptance by the community interested in studying.

The managers of an educational institution may wonder what makes an academic online program stable and reliable to the community eyes, having a well structured academic program does not guarantee acceptance thereof by the community and can not always count on the reputation of a quality institution as a backup, is the example of well-established universities with history of excellence and educational quality in teaching academic presential programs that are now beginning to offer their online academic programs, this kind of universities have a slight advantage over those that do not have a reputation that is why it has to perform, regardless the university prestige, a correct choice of learning management system (LMS) from the beginning of the implementation of the online academic program which is available to be implemented.

Some of the most used LMS by important academic institutions are Blackboard, Moodle, WebCT, Dokeos, Claroline among many more, for this research we rely on these five LMS for being the most frequently mentioned in surveys.

### 1.1 Moodle

Virtual environment used to manage courses and that gives teachers the ability to create online learning communities for the impartition of courses. Released under the free software license and created by Martin Dougiamas, who was administrator of WebCT. Rice W. (2011) [3].

### 1.2 WebCT

Web Course Tools, LMS released with private license used by institutions to conduct learning by the Internet. This is a very flexible tool which makes it very attractive for both novice and experienced users. It features forums, online chats, email system and supports various file formats. It was developed at the British Columbia University by Murray Goldberg. In 2005, WebCT merged with Blackboard, another tool dedicated to the delivery of online courses. Miltiadis D., et al. (2010) [4].

### 1.3 Blackboard

Is a LMS developed in 1997 by a consulting firm. The following year merged with “CourseInfo”, another system developer company, years later merged with WebCT, with this takes a lot of strength and ranks as the most used private licensed LMS used by leading universities in the world. In Mexico, ITESM is the only university using Blackboard on large scale for the development of their online academic life. Perez B., Perez T., (2011) [5].

### 1.4 Claroline

It is widely used in parts of Europe and is released under the GPL license (it's free software) like “Dokeos” which is another well-used LMS.
There are some comparisons between some LMS made by some authors, below it shows a comparison chart made by Gonzalez A. (2008) [6], on which compares the two LMS developed under the most popular free software license, Moodle and Dokeos.

2 METHODOLOGY

To reach a result that help us to choose the right selection of tools that will be used in the implementation of the online academic program is necessary to identify parameters that can be compare between different LMS.

This is one aspect of why the title of this research, the LMS must have a simple operation on the front end for both students and teachers. Another addressed aspect in this research is the importance of the operation of LMS on the back end for management and operation in the administration side.

Within this research surveyed 50 students who use either as an LMS tool that complements the daily activity in their courses or as main platform, this to identify important aspects that give confidence to the student who is enrolled in a quality program. The purpose of this survey is to identify important parameters that we can compare them with parameters that emerged from the survey that was conducted at 20 LMS administrators from various local and national universities. That is, two kind of surveys were done, the first aimed at students and teachers and the second for administrators who have a low-level contact with the LMS.

3 RESULTS

3.1 Students surveyed

Below are shown in Fig 1., some of the most relevant questions that were applied within the survey of students and teachers.

<table>
<thead>
<tr>
<th>Question 1. Which is the LMS that you currently use?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Moodle 71%</td>
</tr>
<tr>
<td>b) Blackboard 12%</td>
</tr>
<tr>
<td>c) Dokeos 7%</td>
</tr>
<tr>
<td>d) WebCT 4%</td>
</tr>
<tr>
<td>e) Claroline 6%</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question 2. Which aspects caught your attention on your first contact with the LMS?</th>
</tr>
</thead>
<tbody>
<tr>
<td>a) Ease in interface menus</td>
</tr>
<tr>
<td>b) Good Design</td>
</tr>
<tr>
<td>c) Speed of site response</td>
</tr>
<tr>
<td>d) Ability of supported formats by the document editor</td>
</tr>
</tbody>
</table>

A: 71%  B: 12%  C: 7%  D: 4%  E: 6%
Question 3. In the following characteristics, point the most important that should an LMS have.

a) Ability to play multimedia learning objects on server-side
b) Web 2.0 tools available from the LMS interface
c) Social Network Connectivity from the LMS interface
d) Connectivity with a file backup service in the cloud for students

Fig. 1. Survey results applied to students and teachers

3.2 Survey applied to LMS's administrators.

In the below figure, are shown some applied questions in the LMS's administrators survey.

Question 1. Which is the LMS that you currently administrate?

a) Moodle 60%
b) Blackboard 20%
c) Dokeos 10%
d) WebCT 5%
e) Claroline 5%

Question 2. The LMS installation and configuration that you use, is it complicated?

<table>
<thead>
<tr>
<th>LMS</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moodle</td>
<td>2 (17%)</td>
<td>10 (83%)</td>
</tr>
<tr>
<td>Blackboard</td>
<td>1 (25%)</td>
<td>3 (75%)</td>
</tr>
<tr>
<td>Dokeos</td>
<td>1 (50%)</td>
<td>1 (50%)</td>
</tr>
<tr>
<td>WebCT</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>Claroline</td>
<td>1 (100%)</td>
<td>0 (0%)</td>
</tr>
</tbody>
</table>
### Question 3. How often do you restart the server due to increased RAM usage by the LMS?

<table>
<thead>
<tr>
<th>LMS</th>
<th>Every month:</th>
<th>Every 2 months:</th>
<th>Every 6 months:</th>
<th>Every year:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moodle</td>
<td>0</td>
<td>2 (16%)</td>
<td>5 (42%)</td>
<td>5 (42%)</td>
</tr>
<tr>
<td>Blackboard</td>
<td>0</td>
<td>2 (50%)</td>
<td>2 (50%)</td>
<td>0</td>
</tr>
<tr>
<td>Dokeos</td>
<td>0</td>
<td>2 (100%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>WebCT</td>
<td>0</td>
<td>0</td>
<td>1 (100%)</td>
<td>0</td>
</tr>
<tr>
<td>Claroline</td>
<td>0</td>
<td>1 (100%)</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

### Question 4. Reasons that have caused offline times

<table>
<thead>
<tr>
<th>LMS</th>
<th>LMS's failures:</th>
<th>LMS's update:</th>
<th>LMS's Migration:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Moodle</td>
<td>1 (8.3%)</td>
<td>9 (75%)</td>
<td>2 (16.7%)</td>
</tr>
<tr>
<td>Blackboard</td>
<td>2 (50%)</td>
<td>0 (0%)</td>
<td>2 (50%)</td>
</tr>
<tr>
<td>Dokeos</td>
<td>1 (50%)</td>
<td>1 (50%)</td>
<td>0</td>
</tr>
<tr>
<td>WebCT</td>
<td>1 (100%)</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Claroline</td>
<td>0</td>
<td>1 (100%)</td>
<td>0</td>
</tr>
</tbody>
</table>

**Fig. 2. Survey for LMS administrators**

### 4 CONCLUSIONS

Analyzing the results, we can see that there are several important parameters so that the academic program has acceptance. According to the survey results, some detected parameters are the visual impact, ease in handling LMS's menus and interoperability that must exist with the Web 2.0 tools that interact directly with the user within the LMS interface, such as embedded video, questionnaires, document sharing through google apps, dynamic presentations, RSS feeds, social networks, etc.
The above mentioned are parameters which are detected by surveys, which are always going to be considered when selecting the LMS for the successful implementation of the online academic program being carried out.

Web 2.0 has been an important pillar for the online education because with the advance of technology the necessity has arisen by the facilitators of implement new techniques and teaching tools to satisfy the learning needs of the new generation students, as the digital natives named after Prensky (2001) [7].

The surveys applied to administrators, show how results lean to Moodle as the LMS with a simple installation and setup, a better memory management, impacting on less off-line time and also with the lower failure percentage.

These results help us determine the LMS with better acceptance for its stability, interface, memory management and lower malfunction. In determining the perfect LMS will help to the academic program acceptance, having a high percentage of success in its implementation as an online educational offerings.

There is work to be done, with the identified variables it will attempt to be done a correlation study between variables of different groups of people, in this case between the group of students and teachers against administrators group and try to find a relationship that help to determine an important factor in the stability of the server that contains the LMS reducing offline time.

REFERENCES


