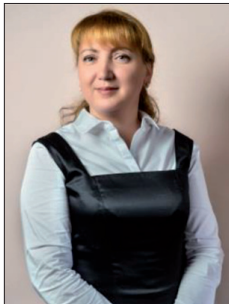


Using LMS for Supporting Training Mathematics in Higher Education



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Abstract

The article deals with the most common learning environment that is used for organizing the learning process in higher technical educational institutions. The article defined basic functions of learning management systems, these schemes appearance learning environments in the world of education, defined main directions, which can be used by educational environment in the process of organization and management studies.

Keywords: ELEARNING PLATFORMS, LEARNING MANAGEMENT SYSTEM (LMS), LEARNING ENVIRONMENTS, DISTANCE LEARNING, MOBILE LEARNING

How can we best prepare students to succeed in the 21st century? This is a question of paramount importance to educators, employers, parents and the public.

Public education provides the bedrock, from which our national and individual prosperity rise together.

The No Child Left Behind Act of 2001, which re-authorizes the Elementary and Secondary Education

Act of 1965, emphasizes student achievement and requires assessments in core the subjects, which are the foundation for learning. This federal law is focusing the attention of schools and educators on fundamental knowledge and skills.

This is an excellent start. We can do even more. The nation needs a compelling vision for education that will inspire education leaders, teachers, parents

and students alike. Clearly, we must work together to fully prepare people for the challenges of work and life in the 21st century.

The Partnership for 21st Century Skills, a unique public-private organization of leaders and educators in business and education, has come together to help schools fully address the educational for 21st century skills [4, 4].

Today's education system faces irrelevance unless we bridge the gap between how students live and how they learn. Schools are struggling to keep pace with the astonishing rate of change in students' lives outside of school. Students will spend their adult lives in a multitasking, multifaceted, technology-driven, diverse, vibrant world – and they must arrive equipped to do so. We also must commit to ensuring that all students have equal access to this new technological world, regardless of their economic background.

Moreover, we know more today than ever about how students learn. Researchers and educators in recent years have made great strides in mapping the remarkable territory of the human mind. We now have scientific insights that can inform educators about the cognitive processes of learning, effective teaching strategies for engaging students in learning and motivating students to achieve. We must incorporate this under-expand beyond basic competency to the understanding of core academic content at much higher levels.

There are six key elements of 21st century learning in the report "Learning for the 21st century" [4, 6]:

- emphasize core subjects;
- emphasize learning skills;
- use 21st century tools to develop learning skills;
- teach and learn in a 21st century context;
- teach and learn 21st century content;
- use 21st century assessments that measure 21st century skills.

Also there are nine steps to build momentum in those report [4, 7]:

- embrace a powerful vision of public education that includes 21st century skills;
- align leadership, management and resources with educational goals;
- use this tool to assess where schools are now;
- develop priorities for 21st century skills;
- develop a professional development plan for 21st century skills;
- make sure students have equitable access to a 21st century education;
- begin developing assessments to measure student progress in 21st century skills;

- collaborate with outside partners;
- plan collectively and strategically for the future.

Most educational centers (e.g. universities, institutes, colleges) are adopting some kind of eLearning tool as an integral part of their learning systems; to enhance their traditional learning system or to create alternative models based on virtual learning. An important resource for these eLearning solutions is the eLearning platform. Therefore, those eLearning centers have to choose the best package of Learning Management System (LMS) suitable to their needs, because there are dozens of packages with diverse feature; some of them are commercial Software, while others are free Open Source (OSS) [3].

Thanks to modern technologies of mobile communication (interaction "student-teacher" is made in high-speed messaging environment) the high level of interactivity is provided with mobile learning and that is crucial thing for education [6].

Nowadays, many university administrations have established departments or centers to manage issues of eLearning (e.g. eLearning center): which include [3]:

- propose the necessary' changes in the system of the university;
- decide the approach of eLearning implantation;
- to implement eLearning as apart of the existing system to enhance the traditional learning system or to establish a parallel system based on virtual learning;
- decides to select the most suitable LMS platform;
- implementing the selected LMS and training the tutors, teachers and related employees;
- maintain, develop and backup the system;
- deciding to select the most suitable LMS platform is a difficult process, because there are dozens of packages (commercial-properties software and OSS), as mentioned, with diverse feature.

What is an LMS? Over the past decade or so, powerful software for managing complex databases has been combined with digital frameworks for managing curriculum, training materials, and evaluation tools. The result is a technology known as the Learning Management System (LMS). Already a nearly billion-dollar industry, LMS products and software allow any organization to develop electronic coursework, deliver it with unprecedented reach and flexibility, and manage its continued use over time [5].

The LMS has become a powerful tool for consulting companies that specialize in staffing and training,

extension schools, and any corporation looking to get a better grasp on the continuing education of its workforce. Its impact has been felt mostly outside of traditional education institutions, though the same technological and market forces are dramatically changing today's classroom as well.

Below is a quick review of some of the common aspects of the LMS industry, a few of its strengths and limitations, and a peek at what the future may hold.

There is no standard industry definition or published standard defining the components of an LMS, but several features are common [5]:

- creation of class rosters, control over registration processes, and the ability to create waiting lists;
- upload and management of documents containing curricular content;
- delivery of course content over web-based interfaces, most often allowing remote participation by the instructor or pupil;
- creation and publication of course calendars;
- interaction between and among students, such as instant messaging, email, and discussion forums;
- methods of assessment and testing (like creating pop quizzes).

LMS systems used in corporate training environments often have additional features that satisfy goals relating to knowledge management and performance evaluation, such as [5]:

- automatic enrollment and reminders for mandatory courses;
- options for manager access, such as to approve materials or participation;
- integration with human resource systems for tracking employment eligibility, performance goals, and similar corporate priorities;
- control over access and class groupings according to a number of metrics, such as geography, involvement in a particular project, or levels of security clearance.

Like many information technology innovations from the past few decades, LMS software is able to add a level of efficiency to companies' learning systems, with a number of other benefits emerging as well, such as [5]:

- easily adapting and reusing materials over time;
- more choices for creators of curriculum, such as method of delivery, design of materials, and techniques for evaluation;
- creating economies of scale that make it less costly for organizations to develop and maintain content for which they used to rely on third parties;

- improvements in professional development and evaluation, allowing companies to get more value from human resources while empowering individuals with additional tools for self-improvement.

For the past decade, the LMS market has evolved from providing tools that were purchased at the departmental level to enterprise-class systems purchased at the institutional or even system-wide level. However, since about 2004 the market has been fairly consistent, dominated by Blackboard corporate strategy.

Blackboard went public in 2004, signaling a real market worth of investors' attention. In 2005 – 2006, the market was dominated by Blackboard's acquisition of WebCT, the number 2 player in LMS, resulting in a somewhat extended Department of Justice approval cycle. Starting in 2006, Blackboard was awarded the infamous '138 patent and subsequently filed suit against Desire2Learn, the new number 2 player in LMS. About this same time, open source started to become a viable alternative to proprietary systems in general, and Blackboard in particular, in the form of Moodle and Sakai. From 2006 – 2009, open source became fully established for campus-wide or system-wide LMS deployments. In late 2009, Desire2Learn successfully fended off Blackboard patent lawsuits, ultimately resulting in all 38 claims being ruled invalid by a US Court of Appeals. On the heels of these efforts in 2009, Blackboard purchased Angel, taking another competitor out of the market [2] (figure 1).

Capterra [8] helps people to find and compare the best software. One of Capterra's greatest categories is the LMS Directory. The 20 Best LMS infographic that was created are based on the most popular options as measured by a combination of their total number of customers, active users and social media presence. Enjoy and do not forget that Capterra can help as choose the best LMS software.

The Best 20 Learning Management Systems according to Capterra are Moodle; Edmodo; Blackboard; SumTotal System; Skillsoft; Cornerstone; Desire2Learn; Schoology; NetDimensions; Collaborize Classroom; Interactyx; Decobo; Instructure etc (figure 2) [7].

LMS have emerged from an auxiliary role to a critical one in higher education. Current college students are technologically savvy and demand their faculty to use technology and LMS. The consolidation of commercial learning management systems resulting from the acquisition of WebCT by Blackboard, and the resurgence of Angel and Desire2Learn in the

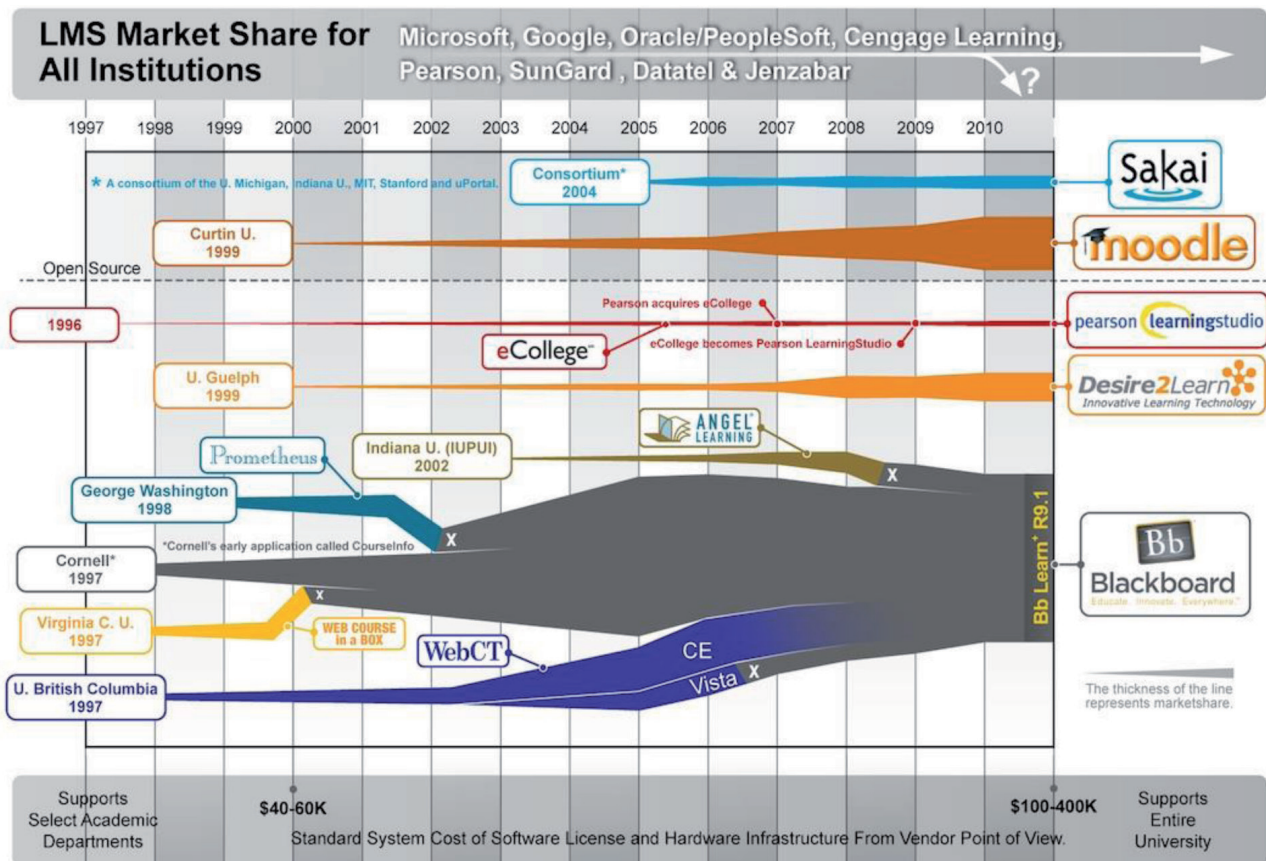


Figure 1. This data represents how many U.S. campuses use a particular LMS as their campus standard [2]

same market, has been mirrored by a growth in popularity of open source LMS. Two major open source movements are increasing their share of the education space: Moodle and Sakai. This paper explores the latest trends in these two initiatives and discusses some of the most successful implementations to date in the United States and internationally. Judging by the large number of Blackboard employees who attended the 2005 Sakai Conference in Austin, Texas, open source learning management systems are of great interest to the companies marketing their commercial counterparts. Judging by the number of academic institutions, which have recently vowed to deploy Sakai to consolidate their numerous learning management systems into one, this trend demands further analysis. Higher education institutions, particularly those with budget constraints, are very attracted to open source LMS because of their cost savings and more control. [1]

On the home page of the Moodle web site at <http://moodle.org>, we find that “Moodle is a course management system (CMS) – a free, Open Source software package designed using sound pedagogical principles, to help educators to create effective online learning communities. You can download and use it on any computer you have handy (includ-

ing webhosts), yet it can scale from a single-teacher site to a 40,000-student University.” It follows with “Moodle has a large and diverse user community with over 100,000 registered users on this site alone, speaking 70 languages in 145 countries.” Moodle has proven very popular in European and American countries [1].

Therefore we decided to use Moodle in teaching engineering students in the State Higher Educational Institution “Kryvyi Rih National University”. We have created courses in mathematics (figure 3) that help students to improve their knowledge of course, check their level of preparedness for the classroom lessons, the writing module works. The created tests make possible to find the gaps in students’ knowledge on a specific topic of the course.

So, the best and worst thing about Moodle is it’s complexity – there are so many features and settings that you can make Moodle do and look like whatever you want, but it can be a bit overwhelming for a teacher new to using an LMS. However, the support community – both instructional and technical – is very responsive and helpful. Being open source, Moodle is continually being upgraded and integrates with many other digital tools, for example, Piazza. No other LMS compares to Moodle.

Engineer pedagogics



Figure 2. Top LMS software [7]



Figure 3. Courses in mathematics for engineering students in the State Higher Educational Institution “Kryvyi Rih National University”

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