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# Learning management systems use in science education

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**Abstract**

Learning management systems have become increasingly attractive in recent times. Modern education is highly technical dependent and this has redefined teaching learning process. Learning management systems have positive implications in education. Learning management systems are considered to be largely applicable for natural sciences as they enable representation of phenomena, foster experimental study and enable the creation of models and problem solving applications

*Keywords:* Learning Management Systems, science education, problems, distant learning

## 1. Introduction

Nowadays, the computer is a significant part of the learner's daily life. It is, by now, inevitable that methods of teaching and learning should include E-learning components that are based on the computer environment (Martin & Madigan, 2006).This new pedagogy, in the case of science teaching and learning, employs: High-order thinking and learning skills, a constructivist approach to science teaching and learning, and information, communication, and scientific literacy skills using digital means and advanced technologies. Teaching in an E-learning environment can contribute to the ability to teach, the ability to learn and most important to bridge between two main components in the classroom, the teacher and the learner. E-learning provides different environments for learners with dynamic, interactive, nonlinear access to a wide range of information (text, graphics, and animation) as well as to self-directed learning in online communication e-mail and forums (Kotzer & Elran, 2012).

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Contemporary studies have focused largely on the examination of students' ideas/perceptions of concepts and phenomena within the field of natural sciences. In the following years, students have to develop a more active role in the educational process, and consequently the student must be the main person in the learning process. Contemporary instructional approaches expect students to be active producers of knowledge (Psycharis, 2011). Learning management systems (LMS) are considered to be largely applicable for natural sciences as they enable representation of phenomena, foster experimental study and enable the creation of models and problem solving applications (Kidney et al., 2007;  Psycharis, 2011).

A LMS is software used for delivering, tracking and managing training/education. LMSs range from systems for managing training/educational records to software for distributing courses over the Internet and offering features for online collaboration (Kotzer  & Elran, 2011; Mahnegar, 2012). Sallum (2008) describes LMS as a high solution package that allows for the delivery and administration of content and resources to all students and employees. This system contains software application and features which make learning content easily accessible and managed. In addition, it helps instructors to provide their students with learning materials and manages student registration. A LMS provides the platform for this type of learning environment by enabling the management, delivery, tracking of learning, testing, communication, the registration process, and scheduling (Cavus, 2013).

LMS are a type of software designed to deliver, track, and manage training and education. Through their development, these systems have been called Course Management Systems, Virtual Learning Environments, Collaborative Learning Environments, and a host of other monikers. The software is similar in functionality, despite its name, and typically includes methods to manage users, role, and course information, online communication, grading, and web-based or blended delivery of content. Within the spectrum of these systems, there are popular commercial products such as Blackboard, WebCT and open source products such as Moodle and Sakai (Lonn, 2009).

Watson (2007) stated that LMS manages tracks and reports on interaction between the learner and the content and the learner and the instructor. LMS Performs learner registration, track learner progress, record test scores, and indicate course completions, and finally allow instructor trainers to assess the performance of their learners. LMS must be able to centralize and automate administration, use self-service and self-guided services, assemble and deliver learning content rapidly, consolidate training initiatives on a scalable web-based platform, support portability and standards, personalize content and enable knowledge reuse.

Each LMS package has its own unique components yet some features that are common to most LMS such as creation of class rosters (student record), control over registration processes, and the ability to create waiting lists, uploading and managing 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 and methods of assessment and testing like creating pop quizzes ( Brown & Johnson, 2007). Most LMS share the following generic features such as 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 (Ellis, 2009). Although LMSs are increasingly seen as mission-critical applications for teaching and learning, very little is known about when, how, or even if these systems promote or are able to "manage" student learning (Salaway et al., 2008). So the goal of the study was to know how to use LMS in science education.

## 2. Related Research

According to a research carried out by Pardamean et al. (2013) they evaluated the graph theory e-learning through the utilization of LMS. They demonstrated that students in the experimental group performed much better than those in the control group. While Psycharis et al. (2013) investigated the role of e-learning as a pedagogical tool for changing initial conceptions when learning about physics by using the learning management System of the Moodle platform. They found that students had strong attitudes towards blended learning, but this was not reflected upon their intention to further use of the LMS. Also Dughila et al. (2013) presented the design principles and implementation of interactive training modules from chemical textile engineering curricula performed on E-learning

platform. This instructional design encourage student interaction and analysis, the student centered approach helps student develop socializing presentation, and analytical skills. Yamin et al. (2012) empirically investigates the activities that students mostly participated while they login to LMS, also investigates the impact of LMS on teaching and learning. The results indicated positive to learning and teaching via LMS.  Akman and Karaaslan (2010) in their study aimed to investigate the perceptions of students in an implementation of "Learning by Design" method through a web based learning environment. That the communication between the instructor and the students contributed positively to not only learning the course content but the quality of the projects as well. As an outcome of this study, many important factors, which lead to successful results in implementation of learning by design method in a web based environment have been identified.  Martín and Fernández (2009) created an online learning community which helps both teachers and students to have a virtual space where we can share knowledge through different kinds of supervised activities, chats and forums. And the result was showing the students' response to this initiative has been very good: the online Physics course helps them reinforce their abilities and knowledge. Reviews of research point to studies providing evidence that teaching and learning with LMS results in improvement in some or all of the following: Motivation, stimulation, attitudes, interest, engagement, focus of task, confidence, enjoyment, persistence, commitment, responsibility, and behavior (Mahnegar, 2012).

### 3. LMS in Science Education

Students can study sciences anywhere they have access to a computer and Internet connection, self-paced learning modules allow students to work at their own pace, flexibility to join discussions in the bulletin board threaded discussion areas at any hour, or visit with classmates and instructors remotely in chat rooms. LMS fosters more interaction among students and instructors than in large lecture courses, E-learning can accommodate different learning styles and facilitate learning through a variety of activities, develop knowledge of the Internet and computer skills that will help learners throughout their lives and careers, successfully completing online or computer-based courses build self-knowledge and self-confidence and encourages students to take responsibility for their learning (Pandey & Pandey, 2009). Learners can test out of or skim over materials already mastered and concentrate efforts in mastering areas containing new information and/or skills (Kalogiannakis, 2010). According to a research carried out by Ekici et al. (2012) using the Moodle course management system to enhance the effectiveness of teaching Basic Physics. They showed that teacher candidates have positive ideas about course instruction with the use of Moodle. The research carried out by Quarless and Nneto (2012) aimed exploring hybrid instruction in science: Using LMS for contextual, interdisciplinary active learning enrichment. Using of the potential of this instructional approach as a means to both build interdisciplinary community in education and innovate instruction for improved learning outcomes.

### 4. Conclusion

The educational process is evolving continually, such as a living organism. The paradigm shifts in education that affected learning theories/concepts have also changed the role of teacher and learner. Older systems have been discarded and learner autonomy has become important. The information is continually renewing, shifting and increasing. LMS is a great way for teachers to organize, manage and deliver course materials. From the didactic point of view, the usage of multimedia tools to create attractive activities makes the learning process friendlier for students.

As a consequence, these activities increase the interest of the students in the study of Sciences. Teachers can provide students with a great amount of resources that usually they cannot show in the classroom due to the lack of time. LMS also makes easier the interaction with the students in real-time and also allows receiving their opinions and suggestions; as a learning community, LMS makes possible for students to share their knowledge and difficulties, so they can help each other via forums and chats. Teachers can notice in which parts of the subject they have more difficulties to understand the concepts developed in the classroom.

Future research is apply learning management system in other sciences, and how developed the LMS and use it as easily and convenient for student.

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