

AN INTRODUCTION TO LEARNING MANAGEMENT SYSTEMS

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Abstract

This paper outlines the fundamental factors that emerge when determining whether a LMS would be an advantage in any given educational environment. Administrators, computer co-ordinators and even classroom teachers are being asked to help determine whether their institution should invest in a Learning Management System. Many know little about the area, their technical skills vary widely and most are unable to tell sales people what they want, let alone negotiate their way through to the best deal. This paper provides a balanced overview of what learning environments can expect from a learning management system.

What is a Learning Management System?

A Learning Management System (LMS) automates many of the processes associated with learning. It is a management software package enabling the delivery of learning content, resources and activities and also handles the associated administration tasks (Hobbs, 2005).

Why Would I Need a Learning Management System?

With the phenomenal growth of information, increased student diversity, new learning theories and ready access to the internet, today's teachers are being presented with an opportunity to transform the learning in their classrooms from a traditional transmission model to a student-centred model. Early last century, students could successfully complete their schooling by memorising a set of static facts and figures and this knowledge often provided a sufficient foundation for them to effectively live out their lives. However, the pace of knowledge generation has accelerated to a point where it is estimated that by the year 2020, knowledge will double every 73 days (Appleberry as quoted by Gillani, 2003). Clearly, to prepare our students to live productive lives in an ever-changing society, it is essential to equip them with the skills to become more responsible for their own learning. In order to do this, we need to adopt a student-centred approach where students can become adept at finding, analysing, organising, evaluating,

internalising and presenting new information (Gillani, 2003) — LMS can provide unprecedented opportunities for this. At their best, computers can support knowledge construction, learning-by-doing, by conversing and by reflecting (Jonassen, 1999b) but managing all this in a student-centred environment is a complex task that might be made more manageable by the implementation of a LMS.

LMSs are sometimes associated with distance-learning in universities but even if a classroom teacher does not want to move away from face-to-face lessons, a LMS can provide benefits in the form of flexibility, such as offering options in self-study activities, extension activities, the types of learning activities available and in the monitoring of the students' achievement (Collis & Moonen, 2001). Flexibility brings with it more independence for the student but also the need for more self-direction and self-motivation. This is very empowering for many students; however, these traits are not to be found in all students at all times, and without careful management, some students can flounder.

There is a difference between delivering content and facilitating learning. When deciding whether a LMS could work in your own environment, think about the implications of using an LMS from a number of different perspectives:

- the students' learning experience
 - the teachers' practices
 - technology requirements, and
 - the ability to maintain these resources
- (adapted from McGovern & Gray, 2005)

The Features of the Average LMS

The majority of Learning Management Systems have the same general features (SUNY, 2005):

- general course organisation (including administration and record-keeping of student marks and absences, as well as general planning for the course)
- content (e.g., lectures, learning objects)
- self-study (including instructions, readings, practical exercises)
- assignments
- testing
- communication (teacher-to-student, student-to-teacher, student-to-student, group-to-teacher, teacher-to-group, etc.)

(Adapted from Collis & Moonen, 2001)

The Advantages and Disadvantages of an LMS

(These are subject to change as new versions are released.)

Advantages

- An LMS allows flexibility of access from anywhere with internet access and usually at anytime.
- Using the correct learning strategies, a LMS can motivate learners, facilitate deep processing, build the whole person, cater for individual differences, promote meaningful learning, encourage interaction, provide feedback, facilitate contextual learning and provide support during the learning process (Ally, 2004).
- A LMS can support content in many formats, e.g., multimedia, video, and text.
- Teachers can access materials anytime. Materials can be updated and students are able to see the changes immediately. Teachers are not confined to a textbook or pre-printed notes that can not be as easily modified in response to student need. Rather, the design and organisation of activities within the LMS can proceed while the course is in progress (Anderson, 2004).
- Learning Management Systems do not automatically guarantee improved teaching and learning outcomes but are shown to transform the teaching and learning process (Anderson, Baskin & Halbert, 2002) to better suit the Y Generation of learners.
- When used creatively, the role of the teacher is not diminished but there is a difference in emphasis: a move from “sage on the stage” to “guide on the side.” However, designing rich tasks capable of facilitating higher order thinking and promoting learning requires considerable knowledge and creativity (Holt & Segrave, 2003).
- It is easy to offer students a choice of activities and more individualised learning programs.
- Learning activities can be shared and/or re-used among courses. By re-using content, much time and effort in lesson preparation can be saved and the cost of developing online content is reduced (Hobbs, 2005).

Disadvantages

- Traditionally, LMSs tend to be course-centric rather than student-centric. The way the available tools can be used is dictated by the need to re-skill teachers. At this time, an LMS does not accommodate a complete range of teaching styles nor do they provide tools for specialized pedagogical practices, e.g., audio discussion boards for foreign language teaching (SUNY, 2005). However some of the more recent versions of LMS do allow greater flexibility, e.g., MOODLE.
- Managing and administering an institution-wide LMS requires a reasonably high level of technical expertise that most classroom teachers do not possess. Therefore those who make the decisions as to what system is to be purchased and how it is implemented are often removed from classroom so only have partial views of the pedagogical implications of the final decisions made (Holt & Segrave, 2003).
- Some teaching staff have poor computer and information literacy skills and little of the information management skills needed to effectively use a LMS to support their teaching. These teachers must not only learn how to operate within these environments but also develop an informed critical perspective of their use of the LMS in teaching in a variety of modes (Weaver, Button, & Gilding, 2002).
- The technology can drive the way instruction is presented (Leflore, 2000). Often in staff training sessions, teachers were preoccupied with “driving” the LMS rather than thinking about using it effectively in their teaching (Weaver, Button, & Gilding, 2002).
- It is a challenge for many teachers to design and organise a mix of learning activities that are appropriate to student needs, teacher skills and style, and institutional technical capacity (Anderson, 2004).
- It is accepted that standing at the front of a classroom lecturing is not enough to holistically educate students but the current LMSs may not be enough to achieve this either. An LMS offers the flexibility that is recognised as being important but doesn't always provide an environment for deep learning and understanding to take place (Mellow, 2005). The types of activities and how the LMS is used will dictate this.
- It is very easy to translate existing poor teaching practices to an LMS.
- It can be difficult to establish a supportive environment such that students feel the necessary degree of comfort and safety to express their ideas in a

collaborative context (Anderson, 2004). Students have commented on becoming frustrated and feeling lost in the mass and feeling isolated (Yacef, 2006).

- The proprietary software market is lacking in the competition required to stimulate new developments competitive pricing. Current customers complain the commercially available LMSs are too costly, unstable, inflexible and too clumsy for most teachers to learn and use effectively (Richardson, 2005).
- There is some research to say that online teaching leads to an increase in teacher workload (Anderson, Baskin, & Halbert, 2002).
- Using an LMS can also lead to teacher dissatisfaction (at least ambiguity) with the quality of the teaching experience (Anderson, Baskin, & Halbert, 2002). Teachers can feel less “in control” (but many would not consider this a disadvantage).
- The common alternative to a LMS, print, is accessible, comparatively low in cost; however print lacks appeal, especially when compared to multimedia (Fahy, 2004).

How an LMS Can Be Used to Serve a Variety of Learning Theories

When the behaviourist, cognitivist and constructivist schools of thought are analysed closely, many overlaps in the ideas and principles become apparent. A Learning Management System can accommodate the principles of all three. Behaviourist Learning Theory states that learning is a change in observable behaviour caused by external stimuli in the environment (Skinner, 1974 as quoted by Ally, 2004). LMSs can support this type of learning: Lecture notes and text activities can be uploaded and sequenced supporting a teacher-directed style. Some of the tools offered by the LMS support drill and practice testing (Smissen & Sims, 2002) and feedback can be immediate.

Other educators claim that not all learning is observable and that there is more to learning than a change in behaviour. Cognitive learning theorists claim that learning is an internal process that involves the use of memory, motivation and thinking and that reflection plays an important part in learning. A variety of content can be provided by the teacher via a LMS from a range of sources based, in part, on the needs of the student (Smissen & Sims, 2002). Information can be

chunked to prevent overload during processing in working memory (Miller, 1956 as quoted in (Ally, 2004). An overview of the lesson can be provided to provide a framework for learning and students can produce concept maps as a summary activity after the lesson (Bonk & Reynolds, 1997 as quoted in Ally, 2004).

Constructivist theorists believe that learning is an active process of construction of knowledge rather than its acquisition. Teaching is therefore a process of supporting that construction rather than transmission of information (Duffy and Cunningham as quoted in Lefoe, 1998). Constructivist teaching tends to be more holistic, more collaborative in method and more encouraging and accepting of student initiative and often provides freedom and variety in assignments and assessments (Henriques, 1997 as quoted in Fahy, 2004).

Constructivists can use LMSs to:

- involve students with real-world problems and situations.
 - model the analytical and thinking skills of the teacher and other experts, which students then apply, with appropriate feedback, to their own problems and constructs.
 - work with authentic problems that reflect real contexts and characteristics.
- (Adapted from Jonassen, 1999a)

Because LMSs can link to external resources and provide a number of collaborative tools, they can provide access to people, ideas and information beyond those found the classroom.

One Implementation Experience

Currently, at The Hills Grammar School (a co-educational comprehensive independent school in Sydney, Australia) the school's computer network is mainly used within the classroom to access the Internet for research and for applications for specialised subject areas, such as in Computing Studies, Languages and the Social Sciences. Additionally, staff use the network for email and administration (mark book, reporting). This year saw the introduction of the School's intranet and the opening of the new Science and Social Science building which houses networked computers in all classrooms and the introduction of a dedicated staff member to integrate technology throughout the curriculum. These factors, plus an increasing need to use computers more regularly in the classroom lead to the introduction of a Course Management System (MOODLE). MOODLE is a course/learning management system (LMS/CMS) — a free, Open Source software package designed using sound pedagogical principles, to help educators create effective online learning communities. It can scale from a single-teacher site to a 50,000-student University.

MOODLE has been introduced to different parts of the school in different ways. In the Senior School, online discussion forums have been introduced. The students are quite adept at using MSN and mySpace, for example, to communicate with each other. This concept of electronic communicating was then applied to a student-centred study group with the implementation of an online discussion forum. The online discussion tool was used in two Year 12 classes as an online study forum where the teacher posted questions and discussion topics for the students to respond. This approach was prompted by a number of students who wanted to do extra revision lessons in preparation for final exams. As these students' time was already heavily committed, it was impossible to find a common time to meet face to face. An online study forum was introduced and the students could log on at any time and contribute to the forum. They were encouraged to respond to other students' input and they were also encouraged to post questions on topics that they needed clarified. The teacher could monitor which students were contributing and she encouraged those students who were not initially involved to contribute. In a traditional face to face revision lesson it is possible to have students who are physically present but still not contributing, similarly there are some students who dominate the discussion. In an online forum every student had the opportunity to participate.

The students were also able to submit prepared essays for the teacher to give feedback. This gave the other students the opportunity to view other students work and read the feedback given by the teacher. This created a collaborative working environment which resulted in improved outcomes for all students involved.

The Junior School Implementation

In 2008 the Technological and Applied Studies Faculty implemented MOODLE to deliver the Technology Mandatory unit to all Year 7 students. The entire unit was posted on the LMS. Some of the tools the students used were quizzes; tutorials created using Captivate software, PowerPoint presentations and assignment submission. MOODLE provided a platform to deliver the same content to the six classes at one time using only the one resource. Students could progress at their own rate and they could access the course content from home so if they were absent they could still keep up with the class. It also allowed greater scope to provide extension activities. The teacher could use the LMS to monitor the students' progress and spend time with students who required more attention. In the development of this resource the staff was able to draw on a number of other resources which had already been prepared for other courses — hence they were not re-inventing the wheel.

Despite the teachers concerned having varying levels of computer literacy, all discovered the benefits of utilising an LMS. As class materials had to be prepared only once, the six teachers involved in delivering the course could give their time to other pressing school duties as this form of delivery reduced the overall workload of all the staff involved. Materials could be prepared ahead of time and be used for emergency lessons when it may not be possible to have a specialist teacher take the class. Additional resources were added as the unit progressed — such as the development of tutorials for new software. The students were able to use these tutorials in a just-in-time fashion. The tutorials created were short and each focused on a specific feature. This was an advantage over the commercially produced pre-packaged tutorials which were longer and less specific, hence students lost interest quickly.

Other Experiences within the School

A technology teacher with fifteen years experience in teaching computer programming recently used MOODLE to teach Year 10 students to write computer programs. The outcome was extremely positive, in fact “the best response from the students learning programming ever.” The Science Faculty have been one of the most active when it came to embracing MOODLE. They collected a range of resources from a variety of sources such as Internet, text book publishers, professional associations and colleagues in the development of their units of work. In 2008 their goal is to have some content delivered by MOODLE in every Year 7–10 unit taught.

Implementation Challenges

Some of the problems faced were the initial development of the lesson resources and adopting appropriate teaching pedagogy. Planning the content was time consuming as was the monitoring of the online discussions and giving feedback. In the example of the Year 12 classes using the online study forum, initially the students were hesitant to participate but after several weeks a greater number of the class were regular users. Another problem encountered was students not taking the online discussion forum seriously. They would post frivolous responses and in one case a student dismissed another student’s contribution in a negative manner. This problem was soon resolved by the student concerned being taken aside and reminded of appropriate etiquette.

One of the main implementation issues was initially setting up MOODLE so that it would run on the School’s network. The school investigated integrating the current log in procedures to map to MOODLE so that we could use the same user names and passwords for both systems.

A whole school approach was adopted to incorporate the changes in the syllabi across all subjects that demanded an increased focus on integrating computers within the classroom. It was proposed to develop and implement the MOODLE environment throughout the school's current computing network. With the assistance of the computing support staff and the technology integrator a MOODLE server was introduced and an exemplar course developed which demonstrated its functionality. Design templates based on the school's colours and layout (in keeping with the existing intranet design) is offered as an example for other teachers. Staff training sessions in using MOODLE effectively when designing lessons and units of work is ongoing. Overall the whole school is embracing the use of a LMS with their current courses.

Conclusion

The decision as to whether a Learning Management System would benefit any organisation is a complex one and this discussion is an attempt to clarify that decision. By bringing much of the current literature together and illustrating these findings using a specific implementation example, we illustrated the fundamental factors that emerge when determining whether a LMS might be advantageous in any given learning environment.

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