

Foreword

Learning Management Systems (LMS) are now ubiquitous in institutions of higher education. This has occurred very rapidly with adoption being widespread but with little standardization. LMS's were first used to support delivery with some communication between teachers and learners, but use has now been extended to support learning activities in innovative and diverse ways. They are also being used to increase student engagement and to track student progress – a vastly different approach to the early years of pushing resources to students.

Adoption of LMS's started with experimentation by a few with small systems. Familiarization facilitated wider adoption until eventually the “institution-wide” adoption of large commercial systems became common. Recent developments have extended the range of options from a few large commercial systems to a wider selection of open source, adaptable and specialized systems. In the intervening years from early adoption to now, higher education institutions have also gained valuable expertise in selecting, implementing, using and evaluating technologies to support learning and teaching some of which has been gathered in the chapters of this book.

The authors have focused on a number of areas including: implementation strategies; use of learning management systems and other eLearning technologies; technical developments; evaluation; adoption and acceptance; and supporting skills.

Chapter 1 takes a broad historical focus, reflecting on the background of eLearning from the very early days of teaching machines and computer assisted instruction through to correspondence courses and video conferencing. The role of information and communication technologies in supporting higher education processes, including teaching and learning, is explored leading to the overarching concept of learning management systems and how these support different modes of learning. The major conclusion reached is that pedagogy should drive the development and use of an LMS.

Chapter 2 argues that learning and knowledge is facilitated by social interactions, implying that communication should be a key component of any eLearning system. The author argues that an LMS should facilitate social interactions at a number of levels independent of temporal or geographic constraints or the context that the knowledge activity takes place in. The communication should be facilitated by whatever means are available independent of specific LMS characteristics.

The use of Web 2.0 technologies to support learning in a vocational setting is explored in chapter 3. The authors posit that despite the uptake of eLearning technologies in higher education generally, there is less evidence of uptake in the vocational sector. They aim to answer questions about whether technology can supplement the hands-on approach of vocational training, in particular the use of web 2.0 technologies such as wikis and forums. They present a case study the outcomes of which suggest that although there is potential for educational technologies to offer great benefits for vocational training, there is still much work to be completed in this area.

Chapter 4 investigates the use of LMS usage logs to facilitate teaching and learning. This is not an uncommon activity in commercial settings and, in an eLearning situation, can reveal valuable information about how the LMS is being used. The authors explore how the data can be analyzed to better inform their understanding of the online activities and, as a result, inform and improve the eLearning strategies that support institutional, faculty and departmental use of the LMS.

In a similar vein, chapter 5 explores usage patterns in a specific LMS, ANGEL. Here data mining is used to explore LMS feature use. Using machine learning techniques it is possible to predict: the courses will use the ANGEL system most effectively based on course specific attributes; the interaction between features or sets of features that impact on usage; and those features that are most commonly used. This leads to a set of results that can be used by the institution to inform future decision making regarding feature selection within an LMS, the design, selection and implementation of an LMS, as well as identifying areas requiring additional training.

Chapter 6 further explores usage, investigating critical factors that influence the acceptance and use of an LMS by instructors. The author suggests that although LMS survival is determined by instructor and student use, adoption is initiated by the instructor's acceptance and subsequent use. Through a comparison of instructors' acceptance of technology, LMS characteristics and organizational characteristics for the acceptance of eLearning, a model of overall acceptance and use is developed in a distance education setting. The study also provides insights into what additional support is needed in situations where computer use and Internet literacy is not high.

In chapter 7 the issue of LMS interoperability with other systems in educational institutions is explored. The authors point out that although the LMS is directed at supporting learning it cannot be isolated from other systems in the institution. Two systems have been selected for the comparison representing a significant market share. A number of facets were selected for the comparison, using currently accepted standards, including: system communication with operational environment; learning content management; and academic management. The overall conclusion is that LMS interoperability leaves a lot to be desired. Standards relating to communication and content are relatively well developed but significant work still needs to be done in the area of interoperability of academic management.

The advent of mobile technologies and the impact on course management systems in higher education is explored in chapter 8. The authors address the issue of designing such a system in the context of the Moodle LMS, specifically they investigate the application of W3C Mobile Web Best Practices 1.0. A framework is designed for a server-based mobile version of Moodle that follows the W3C guidelines.

The enhancing of electronic examinations is explored in chapter 9. The authors explore an extension to multiple-choice questionnaires which allow for novel grading methodologies to be employed. They suggest that simple positive scoring rules and mixed-scoring rules introduce bias for a number of reasons. However the paired scoring method introduced here overcomes some of the shortcomings of these other methods. The authors do emphasize that the initial workload associated with constructing the question bank for multiple-choice questions is high, but overall it is concluded that the enhancements suggested here add to the value of examination tools within an LMS.

With the widespread adoption and use of LMS's in higher education, the authors of chapter 10 highlight the need for these systems to be accessible to all students. An evaluation framework is developed to evaluate the accessibility of LMS's based on particular accessibility standards as well as other technological and human criteria. The framework is tested using the widely used LMS, Moodle, using the perspective of visual-impairment. A number of findings are reported, not least of which is that Moodle does not meet accessibility standards fully.

In chapter 11, the authors describe the legal requirements of using eLearning so support distance learning in higher education in Poland. They explore the implications of the regulations and how this has shaped LMS use. They compare the educational processes required of blended- and e-learning pathways and how different technologies can support aspects of those pathways. Extensions to the LMS that are required to support learning needs are discussed. The authors also point out that there are implications for the development of materials (e-content) which increase the cost of production on a number of levels. Finally the authors present an eLearning presentation engine that overcomes some of the difficulties associated with producing e-content.

A comparison of Internet and LMS use is undertaken in chapter 12. The authors propose that more attention should be given to users' Internet skills when developing LMS strategies since most LMS's are web-based and most students are already adept at navigating the Internet before starting to use the LMS. The results support this proposition but also indicate that consideration should be given to using collaborative platforms such as web 2.0 technologies in place of email since many students are more familiar with using wikis and blogs for example. These outcomes can inform the selection and implementation of suitable digital pedagogical processes and tools that meet both teacher and student needs as well as informing the development of eLearning policies.

Chapter 13 presents the process used by one higher education institution to determine an appropriate institution-wide LMS. The institution had a history of pockets of use and innovation to base the selection on. A subsequent evaluation of the adopted system has shown that use of the system is limited to resource sharing and organizational support, the most commonly used activities in the previous collection of systems. The authors suggest that the introduction of an eLearning policy could be instrumental in enhancing and extending the use of the LMS more fully. However they have identified that any extensions of use are beyond the current capacity of the system and support services, a catch-22 situation given the imperative of supporting the modern student digitally.

A case study of using eLearning strategies to improve students' generic skills is presented in chapter 14. Problem-solving, information management, group work and communication skills are the focus of this study. A combined strategy incorporating discussion boards, group tutoring, collaborative learning and peer assessment were implemented together with a number of assessment regimes including surveys, online activity analysis and group evaluations. These have resulted in improved student performance as well as improved perceptions of the accessibility of teachers, even though this is online. The study found that teacher participation is a key factor in motivating students to engage with learning activities as well as to lead discussions.

The concluding chapter, chapter 15, explores different strategies that can, and have, been used when implementing an LMS. Two main influences are whether a top-down or a bottom-up approach is adopted. These determine the different levels at which key decisions are made. The authors present three case studies which demonstrate the different approaches. All three use a blend of the two approaches but in different mixes. All institutions eventually implemented the same system despite the different foci. Regardless of strategy it seems the key to success includes good networking and communication throughout the implementation process.

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