

Selecting an LMS: Questions to Consider

By Clayton R. Wright, Valerie Lopes, T. Craig Montgomerie, Sunday A. Reju, and Seb Schmoller

Each item under the following headings covers an LMS feature or a task an LMS executes. In some cases, a question's location under a specific heading is arbitrary, as the item could be placed under one or more subheadings. The items can help you in the selection process; you can modify them to suit your needs and include them in your LMS evaluation rubric. That rubric might, for example, simply indicate the presence or absence of a feature or rate the execution of a feature or task on a scale of 0 to 5 — such as 0 = not present and 1 = poor and 5 = excellent or 1 = difficult to use and 5 = easy to use or 1 = poorly executed and 5 = well executed. If you do use a rating scale — recommended for many of the features listed below — you must ensure that the software meets your functionality needs and technical requirements by actually using the LMS in your instructional/learning environment. It would not be prudent to depend solely on information provided by a vendor or presented during a demonstration.

The questions provided here are indicative, not definitive. They list features or tasks that can be performed by LMS software and are a starting point for assessing the software from an educational, rather than a technology, perspective. The questions should stir you to consider the characteristics you want your LMS to demonstrate. As you scan the list, note the features that the system must have (needs) and those that might be optional (wishes). Take the time to select only those features that are important to you and to adopt a weighting system that lets you differentiate needs from wishes. You might want a modular LMS that lets you obtain needs now and wishes later. Also, the question list might change when LMSs are designed specifically for mobile devices and new features and functionalities might become possible. Currently, LMSs seem to be designed principally for use with a browser on a desktop or laptop computer, but this situation is likely to change as more students have access to mobile devices and use them to assist their learning.

1.0 Background Questions – Answers to these questions will frame the search for a new LMS.

- 1.1 What is the strategic direction the institution wants to take over the next three to five years and beyond?
- 1.2 What is the educational philosophy of the institution that will guide its pedagogical directions?
- 1.3 What is the current enrollment of the institution and the expected enrollment in three, five, and 10 years?
- 1.4 What data do instructors need to guide and support student learning?
- 1.5 What information could be gathered and analyzed by an LMS that would help the institution during its periodic review of programs and courses?
- 1.6 What features of the current LMS do users like?
- 1.7 What features of the current LMS are challenging to use?
- 1.8 What features are missing from the current LMS that users want?
- 1.9 What are the current systems that a new LMS must integrate with or link to (e.g., human resources management systems, financial management systems, and government databases)?
- 1.10 Are there any major software purchases in progress or under consideration that the new LMS must integrate with?
- 1.11 Does the institution have specific requirements regarding the purchasing of software — such as that an RFP must be issued for purchases above a certain cost — that might affect how an LMS is selected and implemented?
- 1.12 What definitions will the selection committee use for the following terms, which are typically associated with an LMS purchase or lease: accessible, user-friendly, flexible, scalable, reliable/stable, robust, efficient, secure, and cost-effective? Or, what indicators will provide

evidence that the LMS solution is accessible, user-friendly, flexible, scalable, reliable/stable, robust, efficient, secure, and cost-effective? For example, an LMS might be considered user-friendly if it appears to be intuitive to use, requires minimum training, and/or can execute operations in three clicks or less.

2.0 General Questions about the LMS Solution – The questions below cover the history, reliability, and reputation of the software, as well as the availability of independent reviews and the presence of an active user community.

- 2.1 Is the software proprietary or open source? Does it make a difference whether the software is proprietary or open source?
- 2.2 How long has the LMS been available?
- 2.3 Is the LMS produced by a known and reputable institution or company? Is the company stable?
- 2.4 Has the software evolved over time? What evidence exists to indicate that the LMS might keep pace with future advancements?
- 2.5 What educational institutions currently use the software? Are software reviews available from these institutions?
- 2.6 Has the software crashed while in use at other institutions? How many times has the software crashed? For how long was the LMS unavailable?
- 2.7 Are independent reviews of the software available? If so, how is the software rated relative to other options?
- 2.8 Is the software available for a trial period at no or minimal cost? What are the conditions for this trial?
- 2.9 What languages does the software support?
- 2.10 Does it support standard browsers (e.g., Google Chrome, Firefox, Internet Explorer, Opera, and Safari)?
- 2.11 Must the LMS software be installed on the institution's server, or can it be hosted by a vendor or in the cloud?
- 2.12 What kind of user and technical support is available? What proof is available from other institutions about the quality of the support that is provided? Is the company that produced the software committed to friendly, quick, helpful, and accurate support?
- 2.13 Does the LMS have an active user community?
- 2.14 Can the LMS be branded with the institution's name and logo? If so, is there an additional cost?

3.0 Course Design Features – These features help instructional designers and faculty adapt existing courses to the new LMS as well as develop courses from scratch.

- 3.1 What migration or conversion tools are available that will help move data or import and export course material from one LMS to another?
- 3.2 If migration tools are available, what information cannot be transferred and must be re-entered from scratch? Can the migration tools move only content, or can they move both content and links to various parts of the course?
- 3.3 What course authoring tools are provided?
- 3.4 Can third-party tools — such as Adobe Flash, Adobe Captivate, Articulate Storyline, Articulate Studio, Lectora Inspire, and/or TechSmith Camtasia — be used to design courses?
- 3.5 Are course templates provided?
- 3.6 Can the templates be customized?
- 3.7 As information is entered to complete templates, does the LMS provide prompts or examples?
- 3.8 Can course templates be created?

- 3.9 Can information be entered without using a template?
- 3.10 Can courses be divided into different modules with their own objectives, resources, activities, and assessments?
- 3.11 Does it support common file types (e.g., OpenOffice.org, Microsoft Word, and PDF)?
- 3.12 Can existing course files be uploaded?
- 3.13 Can files be uploaded in a compressed format, such as a zipped file?
- 3.14 Can files be uploaded quickly with a few clicks?
- 3.15 Can course cartridges or e-packs from publishers be loaded on the LMS? If so, are cartridges limited to specific publishers?
- 3.16 Can various types of media be uploaded? What audio and video standards does the LMS support (e.g., HTML5 video)?
- 3.17 Can media files be uploaded easily?
- 3.18 Can content be tagged? If so, what metatag schemes can be used?
- 3.19 Can the content on a page be easily rearranged via a drag-and-drop feature?
- 3.20 Can the LMS support the development of interactive activities?
- 3.21 Can the content be linked within and outside of the course?
- 3.22 Can users define files or groups of files via a file manager?
- 3.23 Can a master course file be created that later can be customized for different groups of learners? Can the content be shared among different courses?
- 3.24 Can rubrics be created that can be used or accessed in different course sections or from one term to another?
- 3.25 Can instructors compile their own glossaries?
- 3.26 Is a spell checker available?
- 3.27 Can the spell checker be customized?
- 3.28 Does the spell checker work throughout the LMS or only for specific tasks such as data entry, chats, discussions, whiteboards, and so forth?
- 3.29 What dictionary is the spell checker based on?
- 3.30 Is a built-in translator provided? If so, what languages can be translated?
- 3.31 Can mathematical and science equations be written and edited within the LMS?
- 3.32 Can the look and layout of each LMS page be customized?
- 3.33 Can display settings such as font size, heading size, and color be set once for a course? Can an institutional presentation style be established and used for all courses or specified courses?
- 3.34 Does the LMS support the Sharable Content Object Reference Model (SCORM), a suite of standards for web-based learning environments? If not, does it support a similar standard that promotes accessibility, interoperability, and reusability of learning content?

4.0 Teaching and Learning Tools – These tools facilitate instruction and learning activities, particularly communication and collaborative activities. They also affect what students and instructors can view and control.

- 4.1 Is the software intuitive, or do faculty members require considerable training to use it? How long would it take for instructors with no LMS experience, and instructors with extensive LMS experience to develop a typical course using the templates provided? How long would it take instructors to become competent at delivering courses via the LMS?
- 4.2 Can instructors and students access tutorials, tailored to their specific needs, on how to use the LMS?
- 4.3 Are vendor-provided tutorials available in several formats, such as screen capture videos with supporting audio and text-based manuals?
- 4.4 Can users adjust the vendor-provided tutorials?

- 4.5 Can the institution re-brand the vendor-provided tutorials?
- 4.6 Are the vendor-provided tutorials available in only one location or wherever they might be needed?
- 4.7 Can an instructor easily establish and modify a course profile and calendar?
- 4.8 Can an instructor easily create textual content, develop tests, assign grades, and send messages without technical help?
- 4.9 Can instructors easily add streaming and multimedia content to courses?
- 4.10 Does the LMS provide a “what you see is what you get” (WYSIWIG) HTML editor? If so, can the WYSIWIG editor be used throughout the LMS, or is its use restricted to specific LMS features?
- 4.11 Once items are posted, can they be edited quickly and easily?
- 4.12 Which of the following communication and collaboration features does the software provide?
 - a. Announcement
 - b. Calendar
 - c. Bulletin board
 - d. Chat
 - e. Blog
 - f. Discussion forum
 - g. e-Mail
 - h. Journals
 - i. Groups
 - j. Messaging
 - k. Portfolio
 - l. Real-time polling
 - m. Survey
 - n. Videoconferencing
 - o. Whiteboard
 - p. Wiki
- 4.13 Which of the above software from a third-party can be integrated with the LMS?
- 4.14 What other third-party plug-ins can the LMS accommodate?
- 4.15 Does the LMS integrate with various social media platforms (e.g., Google Docs, Facebook, LinkedIn, and/or YouTube)?
- 4.16 Can the whiteboard and chat tools be used at the same time?
- 4.17 Can privacy settings be altered for one or all communication and collaboration tools?
- 4.18 Can users post anonymously when using the communication and collaboration tools?
- 4.19 Can users easily access the calendar tool from any location within the LMS?
- 4.20 Can start and stop dates and times be set in the calendar tool?
- 4.21 Does the LMS support threaded discussions?
- 4.22 Can users attach documents when responding to discussion forums?
- 4.23 Can the discussion forums be moderated?
- 4.24 Can the system enable users of a particular course to view who is logged into the same course?
- 4.25 Can students send e-mail to individual or groups of students registered on the LMS?
- 4.26 Can students send e-mail to individuals who are not registered on the LMS?
- 4.27 Does the e-mail system support attachments?
- 4.28 Does the survey tool allow individuals to respond anonymously?
- 4.29 Does the survey tool contain a feedback form that provides information about the instructor, the course, and the instructor’s teaching skills?
- 4.30 Can feedback about the instructor be sent to the instructor as well as the course administrator and/or department chair?

- 4.31 Can course content be searched?
- 4.32 Can the contents of tools such as discussion forums and e-mails be searched?
- 4.33 Does the LMS support multiple groupings of students so that more than one instructor can teach a given course and a group of students can be divided into smaller groups for tutorial purposes?
- 4.34 Can multiple groups be established within a course so that groups of students can work on a project simultaneously?
- 4.35 Can the LMS randomly assign groups within a course and/or within course sections?
- 4.36 Can files be shared easily with other instructors, one student, or a group of learners?
- 4.37 Can the instructor set limits on the size of files that are submitted as assignments or shared within the system?
- 4.38 Can students view introductory sections or a course's structure without being formally registered in the course? Can students access the course as visitors? (This feature is useful when students are trying to determine which courses to take and want more information than the syllabus provides. It also helps guest speakers become familiar with the course content prior to conversing with students.)
- 4.39 Can information/content be automatically or selectively released to a student or group of students based on a grade or the completion of a specified activity?
- 4.40 Can learners be automatically informed when course information or content is updated?
- 4.41 Can student response systems or clickers be used with the LMS?
- 4.42 Can students make notations within the LMS?
- 4.43 Do learners have private space in which to work? If so, how much space is allocated to each learner? Can this space be expanded? Who has permission to expand the size of a student work space?
- 4.44 Can students create a portfolio of their work that can be set aside in their own workspace and inaccessible to others unless the student gives permission?
- 4.45 Can students enable the portfolio to be viewed publicly?
- 4.46 Can the portfolio comprise a variety of file types, including text, HTML, photographic images, audio, and video?
- 4.47 Can instructors and/or students customize the portfolio layout?
- 4.48 Can students export the content of their portfolios at the end of the course or when they leave the institution? (Students might need access to their portfolio contents when they transfer to another institution or apply for a job.)
- 4.49 Can the instructor send an e-mail to one student and/or a group of students?
- 4.50 Can instructors provide students with links to digital resources available in the learning resource center (e.g., links to databases, e-books, electronic reserves, online journals, and subscription services)?
- 4.51 Can instructors conduct, record, and archive live synchronous sessions that students can access at a later date?
- 4.52 Can instructors and students use their mobile devices to capture video and upload it to the LMS so others can access it? If so, can the uploaded video be compressed so that the file can be stored easily and viewed on mobile devices? What video compression options are available?
- 4.53 Does the LMS have built-in video editing tools?
- 4.54 Can more than one LMS window be opened at a time? For example, can students open a window showing their note-taking space along with a window showing online content or discussion board postings?
- 4.55 Can students track their progress online?

- 4.56 Can students access their marks online?
- 4.57 Can a student enter an alternative mark for an assignment or test in an online calculator to determine how a low or high grade on a test or assignment might alter his or her final course grade?
- 4.58 Can a student attempt a test or assignment several times to improve a previous score?
- 4.59 Can students access course material including text, audio, and video via hand-held mobile devices that operate on platforms such as Apple iOS, Blackberry, Google Android, Linux Mobile, Microsoft Windows, or SymbianOS?
- 4.60 Can students access course announcements, e-mail, chat, discussion, and grades via hand-held mobile devices?
- 4.61 Can the instructor send out reminder notices to students? Are these manual, or can they be sent out automatically at a specific time/date or after the student executes a particular activity?
- 4.62 Does the LMS alert instructors about students at risk of failing or not completing the course?
- 4.63 Does the LMS provide a massive open online course (MOOC) platform? If so, can the MOOC be opened to the general public, or is access restricted to those registered at the institution? How many learners will the MOOC platform support?
- 4.64 Does the vendor support an active teaching and learning user group?

5.0 Assessment Features – These features assist with the design and administration of assignments and tests, and the assessment and recording of student activities and performances.

- 5.1 Can questions be imported and/or exported? If so, in what form?
- 5.2 What publishers' test or question banks are supported?
- 5.3 What type of test questions can be developed on the LMS (e.g., true and false, fill-in-the-blank, word scramble, matching, multiple-choice, and essay questions)?
- 5.4 Can students enter mathematical and science equations in response to a question? How is this done?
- 5.5 Can various media, such as audio and video clips, be added to questions?
- 5.6 Can questions be stored in a database?
- 5.7 How can questions be tagged in the database?
- 5.8 Can the question tags be customized?
- 5.9 Can questions in the database be grouped or randomly selected?
- 5.10 Can quizzes/tests be made via third-party software such as Respondus or Maple TA?
- 5.11 Can questions in the database be tagged for release only for mid-term and/or final examinations?
- 5.12 Can questions be released based on various criteria, such as date, time, grades, a specific activity's completion, or a particular student identification number?
- 5.13 Can the time allotted for test taking be adjusted based on identification number (e.g., can you give students with physical disabilities more time to complete a quiz)?
- 5.14 Can all instructors access questions in the database? Can access be restricted to one instructor or group of instructors?
- 5.15 Can the LMS provide security during online testing? If so, how is this done?
- 5.16 Can the LMS restrict access to the web and/or other parts of the LMS during a test?
- 5.17 Can the LMS allow access to tests only at certain physical locations (e.g., a supervised lab)?
- 5.18 Can the LMS request that a test taker enter an additional password before issuing a test?
- 5.19 Can the LMS accept student submissions in various forms (e.g., Microsoft Word document, PDF file, Zip file, Web page, audio clip, and/or video clip)?
- 5.20 Can assignments be received through a tool similar to Dropbox?

- 5.21 Can students receive a confirmation when their assignment is submitted to the LMS?
- 5.22 Once an assignment has been submitted, can students modify or withdraw their submission before the instructor opens it?
- 5.23 Can students submit assignments individually or as part of a group?
- 5.24 Can students decide who to share files with? What privacy settings are available?
- 5.25 Can instructors provide feedback to individuals and groups of students?
- 5.26 Does the LMS let people outside the institution review student work and provide comments (e.g., external evaluators in a business related to the course of study)?
- 5.27 Does the LMS allow work to be assessed in a double-blind manner?
- 5.28 What types of questions can the LMS grade?
- 5.29 How does the LMS handle responses to essay questions?
- 5.30 What plagiarism-detection tools does the LMS provide or link to? Are these tools available to instructors, students, or both? (Plagiarism tools include iThenticate, Plagiarism Checker, Turnitin, and Viper.)
- 5.31 Does the LMS provide rubrics that can help instructors assess student assignments?
- 5.32 Can instructors create different rubrics to guide their assessment of different student activities, such as forum participation, student projects, and essay question responses?
- 5.33 Can instructors grade and provide feedback on an assignment without having to download it?
- 5.34 Can students receive their scores immediately after the LMS has marked their online quizzes or tests?
- 5.35 Can instructors include comments with the scores sent to students? (For example, "Your response for question 5 was incorrect. The correct answer is....")
- 5.36 After students complete and submit an online test or examination, can their access to grades be delayed until the instructor releases them?
- 5.37 Can students re-take a test? If so, what conditions can be set to enable this to occur? (For example, tests can only be re-taken after a set time period.)
- 5.38 If a student receives a specific grade set by an instructor, can the LMS direct the student to re-take a test or proceed to a specific part of the course?
- 5.39 When a test is re-taken, can the LMS select questions that are at the same level of complexity but different from the questions the student received the first time he or she took the test (i.e., can the questions be randomized)?
- 5.40 Can the responses given by students be mapped against a list of objectives, competencies, or outcomes?
- 5.41 Can instructors assign grades for participation in activities such as chats and discussion forums?
- 5.42 Can the instructor change marks or grades once they have been entered?
- 5.43 Does the LMS provide a centralized gradebook?
- 5.44 Can the gradebook automatically indicate when an assignment was submitted and a test taken?
- 5.45 Can grades be assigned to a group of learners?
- 5.46 When a grade is entered or changed, does the LMS prompt the user for an extra password as a security measure?
- 5.47 Can the grade display be customized?
- 5.48 Can the instructor track the progress of students graphically?
- 5.49 Can instructors enter their own formulas for calculating grades? For example, can the system accommodate weighted grades?
- 5.50 In addition to calculating the group or class average, can the LMS examine grades from different perspectives? What types of reports does it produce?

- 5.51 Does the LMS let users calculate statistics based on grades, such as the class or group average, the median, and the standard deviation?
- 5.52 Can advanced statistical analyses be conducted on assessment results?
- 5.53 Can grades be imported and/or exported via spreadsheet software such as Excel?
- 5.54 Can grades be exported directly to the institution's student information system?

6.0 Accessibility Features – Answers to the questions below address the principle of reasonable access and whether the LMS complies with current accessibility laws.

- 6.1 Can the text be enlarged to accommodate users with poor eyesight?
- 6.2 Does the LMS provide a magnifier that can enlarge any screen item it passes over?
- 6.3 Can images and videos be tagged with alternative text to enable screen readers to convert the text to sound?
- 6.4 Does the LMS support captioning?
- 6.5 If video tutorials on using the LMS are provided, do they include captions that can be read by a screen reader?
- 6.6 Can the LMS be navigated without using a mouse?
- 6.7 Can users employ text-to-speech software, such as the Job Access With Speech (JAWS) program, to read computer screens? Can they convert text to Braille via a refreshable Braille display or Braille terminal?
- 6.8 Can users employ speech-to-text software, such as Dragon Naturally Speaking, to enter information into the LMS, or does the LMS have its own voice-recognition system?
- 6.9 Does the LMS comply with current educational policies and laws, such as the Americans with Disabilities Act?

7.0 Administrative Features – The following questions relate to features that affect security, data management, and reporting and help users administer the course.

- 7.1 Can specific privileges be assigned to various roles — such as instructional designer, instructor, teaching assistant, student, administrative assistant, course administrator, dean, or technical support — or does the system specify the privileges assigned to each role?
- 7.2 Can the system administrator adjust the privileges assigned to each role?
- 7.3 Can an individual be assigned more than one role?
- 7.4 What security features does the LMS offer? For example, does it require the use of encrypted passwords?
- 7.5 Does the LMS support the use of single passwords for instructors and students?
- 7.6 Does the LMS require multi-level passwords for LMS administrators and technical support staff, or is access to restricted LMS areas handled in another manner (e.g., the use of two-factor authentication, such as a password and fingerprint scanner or card reader)?
- 7.7 Does the LMS support authentication using Kerberos, Lightweight Directory Access Protocol (LDAP), or Shibboleth?
- 7.8 Can the LMS force users to create strong passwords?
- 7.9 Can the LMS force users to change passwords frequently (at a minimum, once per term)?
- 7.10 Can the LMS require the use of secondary passwords to release a test or examination, or to change a grade?
- 7.11 Can student enrollment information be imported in bulk/batch (e.g., the names of all students and program affiliations)? If so, what form must it be in (e.g., an Excel spreadsheet)?
- 7.12 Can a student be easily added to or withdrawn from a class or discussion group once most of the students have been added in batch mode?
- 7.13 Can photos of each student be inserted into the class list?

- 7.14 Does the system let courses be divided into sections? Can the sections be separate entities, but have access to core course information and content?
- 7.15 What information does the LMS automatically store?
- 7.16 What information can be selectively captured?
- 7.17 What information and student activity data are encrypted?
- 7.18 Can the LMS encrypt files as they are being transferred from one system to another?
- 7.19 Can data/files be imported and/or exported to existing or future administrative systems such as:
 - a. Finance
 - b. Human resources management system (HRMS)
 - c. Library or learning resources center (LRC)
 - d. Payroll
 - e. Student information system (SIS)
- 7.20 How does the LMS provide library systems with the authentication faculty and students require in order to access restricted library resources?
- 7.21 What reports does the LMS generate?
- 7.22 Can users customize these reports?
- 7.23 Is the student database searchable via a variety of parameters?
- 7.24 Can the activities of all users be tracked (e.g., by their log-in time, log-out time, and time spent on a course element, such as a topic or video clip)?
- 7.25 Can detailed information be compiled about student activity with each course tool (e.g., the number of posts entered on the discussion forum or blog)?
- 7.26 Can instructors track and view the progress and/or performance of one student or a group of students?
- 7.27 Can students receive an automatic alert when they fail to complete an activity by a specified deadline?
- 7.28 Can LMS data be viewed from a variety of perspectives? Does the LMS support learning analytics that provide the information needed to address challenges faced by your learners, faculty, and/or administration?
- 7.29 What privacy features are built into the system? For example, are students required to use their full names on discussion boards, and are student e-mail addresses displayed so that others can see them?
- 7.30 Can limits be set as to how long information on a particular course or user is stored?
- 7.31 Can student portfolios remain accessible to students after graduation? If so, for how long? Can the timeframe be adjusted or can the contents of portfolios be exported to students' personal devices at any time?
- 7.32 What functions can the course administrator override? For example, can administrators override announcements?
- 7.33 Can the LMS support the distribution of system-wide messages, especially during emergencies? Does the LMS support text messaging to mobile telephones?
- 7.34 Can students register and pay for a course online?
- 7.35 Can students order their textbooks, laboratory kits, and other learning resources online via the LMS or third-party add-on or link?

8.0 Technical Aspects – These questions focus only on basic technical considerations; institutional IT specialists should develop a more definitive list that accounts for their current computer and network infrastructure and installed software, as well as their own expertise.

- 8.1 What are the hardware, software, and network requirements of the LMS? What server platform is required? What specific applications, compilers, database management system, languages, toolsets, and so forth are required to support the LMS (e.g., Apache, MySQL, PHP, and Tomcat)? What versions of the software are required?
- 8.2 Can the LMS be easily installed using a single binary or setup file?
- 8.3 What storage capacity is required to accommodate the LMS and associated files?
- 8.4 Can the storage parameters be expanded for each type of user?
- 8.5 What system documentation is provided?
- 8.6 If desired, can the system be hosted locally? Note: this is an exceedingly important question, because the LMS host's location determines which security and privacy laws might apply.
- 8.7 Does the LMS software comply with recognized standards? For example, does it comply with the Sharable Content Object Reference Model (SCORM) that promotes accessibility, interoperability, and reusability of learning content, or the Instructional Management Systems (IMS) standards for locating content, reporting performance, and exchanging information between administrative systems? This latter standard is important if data from the course delivery software must be transferred to a student record system. Both of these standards allow for the development of content that can be exchanged between different software.
- 8.8 Can information from the LMS, such as student grades or marks, be transferred seamlessly to existing institutional software?
- 8.9 According to the vendor, what are the recommended number and type of staff, such as system administrators and programmers, required to support the LMS? What qualifications should these people have?
- 8.10 Can the software be administered easily with the current institutional expertise? Do current staff members have experience with this hardware and software? If not, what type of training do they need? Is this training accessible?
- 8.11 What aspects of the software can institutional technical support personnel gain access to and alter? Can they access the application programming interface (API) that determines how software components interact with each other by communicating with the operating system?
- 8.12 Can the LMS be customized? For example, can default background and text colors be set? Can you change the arrangement and format of items presented to LMS users? What procedures must be followed to customize the software? What programming language does customization require?
- 8.13 Does the LMS allow technical staff to alter maintenance and upgrade schedules, especially when the software resides on the vendor's servers? If a vendor maintenance or upgrade occurred during an examination period, it would be quite disruptive to students.
- 8.14 What are the minimum hardware, software, and network requirements for the learner?
- 8.15 Can the technical requirements be met at learning or study centers? If not, what changes are required?
- 8.16 Will the software automatically adjust to the network speed of those trying to connect with it?
- 8.17 Does the software have security features that prevent unauthorized access to information?
- 8.18 Is this platform scalable? Can it be expanded easily to accommodate a larger number of students and instructors?
- 8.19 How many concurrent or simultaneous users can the LMS handle?
- 8.20 What redundancy features are provided? In healthcare environments, for example, mirror servers might be required. Redundancy features might be both software- and hardware-based.
- 8.21 What backup features, if any, are provided? Can backups be done automatically?
- 8.22 What procedures exist for detecting and fixing bugs and software modifications?
- 8.23 What type of support is available — e-mail, chat, telephone, and/or on-site?

- 8.24 When is the support available (e.g., 24/7 or regular weekday office hours based on a particular time zone)?
- 8.25 What is the guaranteed response time to a request?
- 8.26 What is the cost of same-day or next-day support?
- 8.27 What consulting services are available? Are consulting services available to assist with migration from one LMS to another, software customization, and system debugging and patching? If so, at what cost?
- 8.28 If the LMS is open source, is the source code available? If so, to what extent can it be modified?
- 8.29 If the LMS is open source, how large and active is the open-source community?
- 8.30 If the LMS is open source, what commercial entities will supply support, and what type of support will they provide?
- 8.31 What training will the software vendor or distributor provide?
- 8.32 What training documentation is provided?
- 8.33 When the LMS has been upgraded in the past, has it been easy for users to migrate from one version to another?
- 8.34 How often has it been necessary to migrate from one version of the software to another?
- 8.35 How long is the downtime associated with each migration?
- 8.36 Can content and data be extracted easily from the LMS? If the institution decides to change to a different LMS, what could the institution extract from its current LMS?
- 8.37 Once a new version of the software has been developed, how long are previous versions of the software supported?
- 8.38 What are the future development plans? When is the next version of the software expected?

9.0 Cost of Ownership – Although academics are focused on the teaching and learning aspects of an LMS, it is advantageous for them to have an overview of the total cost to acquire or lease and maintain the system for *X* students during each year of a three- to five-year contract.

- 9.1 What is the purchase or lease cost (license fee) of the software? What are the incremental costs as the number of student registrations and courses increases?
- 9.2 Is the price based on the total institutional enrollment or the number of active users at a specific time?
- 9.3 What are the setup costs — the costs associated with installing the software on an institutional or hosted server?
- 9.4 What are the tiered support plans (e.g., Monday to Friday, 8 a.m. to 5 p.m. in a specific time zone and 24/7 technical support)? How much do these plans cost? Does the cost vary depending on whether support is provided by telephone, e-mail, online chat, or in-person? Does the cost vary depending on the response time — such as within 3, 8, 24, or 48 hours?
- 9.5 What are the projected maintenance costs, and what do these costs include?
- 9.6 What are the training costs for technical staff, system administration, instructors, and instructional designers?
- 9.7 If training is offered through a variety of means, such as via online webinars or face-to-face, what is the cost for each type of delivery?
- 9.8 What costs are involved to develop and deliver customized training?
- 9.9 In addition to training, are there other business or “soft” operational costs that must be taken into account?
- 9.10 What additional hardware and software costs must the institution incur if it obtains this LMS?
- 9.11 What additional technical staff must be acquired to run the LMS, and what is the cost of this added expertise?

- 9.12 If applicable, what will it cost to transfer existing LMS courses to the new LMS?
- 9.13 What costs are associated with integrating the new LMS with existing enterprise software?
- 9.14 What is the total cost of ownership?
- 9.15 Are the purchase, lease, and maintenance costs sustainable?

© 2014 Clayton R. Wright, Valerie Lopes, T. Craig Montgomerie, Sunday A. Reju, and Seb Schmoller. The text of this *EDUCAUSE Review Online* article is licensed under the [Creative Commons Attribution 4.0 license](#).