Platform Evaluation: Moodle for University X

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Organizational Overview

University X (UX), located south of Calgary, Alberta, is a fully accredited, public university that enrolls approximately 15,000 students per year. UX's two main campuses are in Lethbridge and Medicine Hat, with two small centers in Brooks and Drumheller, and a growing presence in Chandigarh, India. UX provides post-secondary academic, trade, technical, career and upgrading programs that lead to certificates, diplomas, and degrees, at both the undergraduate and master's level. Admission policies are flexible, and students can learn in a variety of ways: full-time, part-time, in-class, or online. UX's student population is comprised of many first-generation, mature, part-time, and "non-traditional" learners, the majority of whom reside locally.

UX's Strategic Plan (2010) set the goal for UX to provide the best undergraduate education in Canada; be a leader of social, cultural, economic, and environmentally-responsible development; and be innovative, entrepreneurial, and accountable in achieving its goals. In UX's Five-Year Capital Plan (2014), the number one priority is building a Digital Hub by 2018, which will house the latest in technology and innovative e-learning. UX's strategic directions include commitments to provide accessible and challenging learning environments, use the best pedagogical practices, and engage students actively. These strategic directions are intended to guide and inform all university planning.

In order to achieve these objectives, UX made a commitment to have an online version of every UX course by 2017, with all courses offered online at least once in a three-year cycle. Online course offerings are considered essential at UX, not only to give the university a competitive edge and to solve some of its infrastructure issues but also to allow students flexible

access to courses. With this goal comes the need for a virtual learning environment that will help instructors and students manage their teaching and learning. UX's growth in technology cannot be funded by the Ministry allocation, and tuition for most programs is capped at the rate of inflation. Growth in priority areas, such as technology, needs to be supported through international students and continuing studies, as well as through a reallocation of resources from other areas of the budget.

UX is in the process of reviewing and selecting a Learning Management System (LMS) that will be used across all departments as a central repository for course development and course content. The intention of this report is to provide a recommendation based on UX's goals, needs, and resources.

LMS Evaluation

Although learning management systems have been around for a while, there is currently little literature and no adequate theory or process for selecting a LMS. To understand the affordances and limitations of different LMSs in relation to the stated goals of UX, our team employed Tony Bates' (2015) research-based SECTIONS framework which provided a set of criteria to guide our evaluation. Using the inductive reasoning approach (Bates, 2015), our team determined that Eliademy and EdX Edge are not robust enough to support the university's growing needs. We considered Blackboard, a known solution for many institutions. However, we were concerned about Blackboard's growing dominance and its history of raising prices and providing poor support when institutions became over-reliant on its products. It does not provide much potential for custom development of applications which the university needs in view of its evolving challenges. We considered WordPress as a viable secondary LMS option in the near

future. As the university is working within a tight timeframe, we recommend that it adopt Moodle as its single learning management system effective Fall 2017.

Moodle (Modular Object-Oriented Dynamic Learning Environment)

After completing this review, we determined that Moodle would be the best fit for this university. Moodle is a free and open-source software learning management system distributed under the General Public License. The design and development of Moodle is guided by a social constructivist pedagogy, which is important for UX as it wants to use the best pedagogical practices and engage students actively. Moodle's growth has been steady in the LMS market (Young, 2008; Thibault, 2014). In addition to its extensive user base and worldwide support, it has been named among the top 100 tools for learning in recent years (Hart, 2015). Based on a review of other higher education institutions within and outside Canada with similar needs as UX, Moodle has been successfully implemented and deployed with favourable reviews. (Louisiana State University & A & M, 2007; Lawler, 2011; Mittall, 2011).

Registered sites	54,147
Countries	222
Courses	7,806,609
Users	71,496,032
Enrolments	168,256,288
Forum posts	143,646,593
Resources	71,243,340
Quiz questions	301,842,880

Figure 1. Moodle statistics (Moodie.org).

Employing the SECTIONS Framework

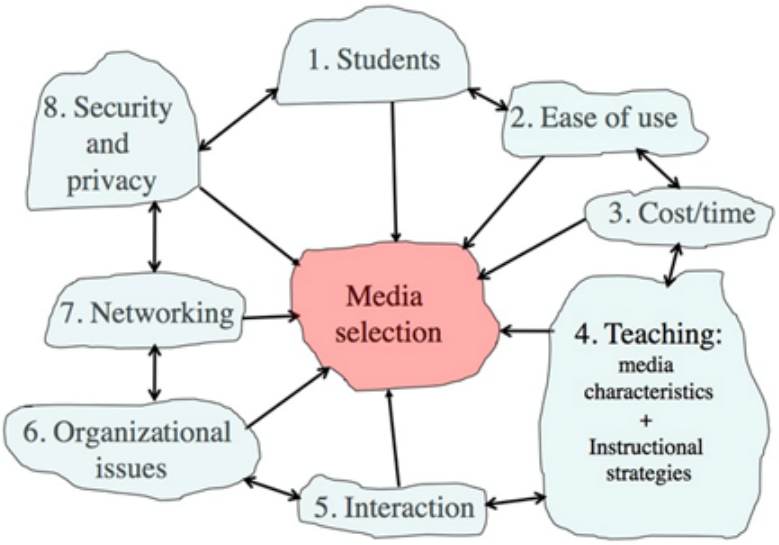

Figure 2. The SECTIONS model (Bates, 2015, 8.1).

Students

These were the first critical questions our team addressed: Who are the students? What are the desired learning outcomes? How well do the unique educational characteristics of Moodle match the student learning requirements?

With campuses located in southern Alberta, as well as a campus in India, UX has an increasingly diverse range of students. Students enrolled in programs ranging from trades to graduate degrees have different prior knowledge, language and technical skills, and preferred learning styles. With the proliferation of student-owned devices, it is also certain that "student expectations for advanced technologies are increasing almost as quickly as the technologies are developing" (Coates, James & Baldwin, 2005, p. 24). We believe that Moodle will accommodate

differences in students' cognitive-perceptual abilities and support the university's commitment to adopt the best pedagogical approaches. Moodle supports 20 types of activities (forums, messaging, glossaries, wikis, assignments, quizzes, polls, scorm players, databases, etc.), which can be customized to guide students through individualized learning paths that build on previous learning outcomes.

A major consideration for our team was Moodle's unique Roles functionality which allows system administrators and instructors to create new roles for students with any mix of capabilities deemed appropriate. Roles can help break down the distinction of teachers and students, fostering a truly collaborative learning environment. Students can facilitate forums, create quiz questions themselves and even control the course content and layout (Momani, 2010).

Ease of Use

It is important that University X choose a LMS that is intuitively easy and convenient to use by students, instructors and support staff. Access and operability are crucial because students and instructors can then focus their time and energy on using the LMS rather than *learning* how to use the technology (Nel, Dreyer & Carstens, 2010). Since UX has many non-traditional learners, ease of use is especially important.

With key features and tools that support both synchronous and asynchronous interaction, file sharing for online and offline learning, navigation, information and activity blocks, and excellent search capabilities, students can access Moodle in a convenient and affordable manner. Moodle is compatible with all makes of devices students will likely use. For student with disabilities, Moodle is compliant with Universal Design for Learning (UDL) standards.

For instructors and course developers, the main advantage offered by Moodle is its modular design with free, downloadable extension modules and course templates (Unal & Unal, 2011). This sets it apart from commercial LMS. There are comprehensive support documentation and tutorials on teaching with and managing Moodle courses. Moodle also allows easy uploading of student data and course registration data.

Cost

There are four major cost categories to consider: development cost, delivery cost, maintenance cost and overhead cost (Bates, 2014). Cost must be considered both in terms of cost to the institution for the platform, server space, and bandwidth (development, delivery, and overhead costs), as well as the cost of faculty time in preparing and managing their individual course spaces. Government funded institutions can maintain budgets by using open source tools such as Moodle. UX can save a significant amount of upfront costs by selecting an open source LMS. With UX's dedicated IT and Ed Tech departments to help with implementation, technical support and maintenance, the ongoing costs of use will be within current budget allocations.

By selecting Moodle, an open source LMS, the institution can reserve funds for additional teaching staff or other faculty that will help maintain a reasonable teacher to student ratio to enable sufficient contact and support indicative of strong practice (Chickering & Erhmann, 1996). For faculty and students, the ease of use of Moodle's platform and interface will reduce their time costs. With UX's local support, faculty can troubleshoot any issues with implementation or design and help manage the amount of time (and thus cost) that is invested in course design.

As uptake in LMS usage increases at UX, the cost savings of not having a licensing fee

should be used to hire additional instructional design or Ed Tech staff. However, as faculty become more comfortable with basic functions of Moodle, they will be able to self-teach more complex interactions and thus the reliance of early adopters on the internal support should decrease. We note that a downside to using open source is that there will be a need to continually perform R&D activities and keep up with new features and functionalities within Moodle. UX will need to ensure adequate staffing to handle this and leverage the expertise of the Moodle community.

Teaching Functions

As we reviewed Moodle from an instructor's point of view, it became necessary to think about the expectations being put on instructors over the next few years. Even though UX has invested in technical support on campus, they do not have many instructional designers. This will be an issue as they work to have an online option for every course by 2017. What this means for individual instructors is that they will be responsible for designing most of their online courses with little support on campus. Moodle has a number of features that can help with this course development, including an intuitive text editor, easy-to-use layouts, and multimedia integration, all supported by a large online community of supporters. As for course delivery, Moodle has a number of features that line up with the "Seven Principles for Good Practice" (Chickering & Erhmann, 1996). The detailed reporting and online marking can help deliver prompt feedback and the multilingual capability respects diverse talents and ways of learning. Finally, the wikis, forums, and peer evaluation tools all help to develop reciprocity and cooperation among students and enable active learning techniques.

Interaction

According to Moore, "there are three different ways learners can interact when studying" (Moore, 1989, p. 1). These include interaction with learning materials, interaction between student and teacher, and student-to-student interaction.

Interaction with learning materials. The Lesson module allows students to navigate through a series of HTML pages. Lessons can be developed to allow students to interact with content in a nonlinear, or linear manner. The Quiz module allows students to evaluate their knowledge by seeing a direct assessment of their answers. Moodle also has the capacity to "allow [students] to interact with LTI [learning tool interoperability] compliant learning resources and activities on other websites".

Interaction between student and teacher. Interaction between students and teachers can take place in several different ways. The Choice module allows the teacher to design and set-up quizzes. The Survey module helps teachers gain information about their teaching performance directly from Students. Through the Assignment module, teachers can grade and give comments on students' work. Finally, the Chat module allows for real-time synchronous discussions.

Student-to-student interaction. Students can access the Chat module for real-time synchronous discussions. They are also able to communicate through the Forums module that allows asynchronous discussions. The Glossary module enables students to create and maintain a list of definitions related to the class. Using the Wiki module, students can add and edit web pages and the Workshop module allows for peer assessment.

Organization Issues

Bates suggests that “most institutions that have successfully introduced media and technology for teaching… have recognized the need for professional support for faculty, by providing instructional designers, media designers, and IT support staff” (Bates, 2015, 8.7.1). Moodle is an Open Source Learning Management system. Although there are no licensing fees, the implementation and management of Moodle will not be “free.” Funds and resources will need to be allocated to support staff and infrastructure in order to ensure a successful implementation and uptake by faculty. In particular, there will need to be adequate support for faculty to develop their courses online through instructional designer support and course development help sessions and other resources.

Networking

According to Bates (2015), these are important questions that need to be asked when evaluating educational technology: “How important is it to enable learners to network beyond a course, with others such as subject specialists, professionals in the field, and relevant people in the community? Can the course, or student learning, benefit from such external connections?” (Bates, 2015, 8.8.1). Considering UX’s goal to build a digital hub to facilitate innovation and the growth of creative industries in the region, the answer is an affirmative. As Chickering and Erhmann (2005) put it, “good learning is collaborative and social, not competitive and isolated” (para. 12).

Our evaluation is further driven by a holistic look at the student demographics and their networking needs. These students are accustomed to social media and expect their learning to be networked. Sharing via social media in Moodle is easy with free plugins, as is connecting with experts through ‘live’ presentations using tools like Adobe Connect which can be seamlessly

integrated into Moodle.

Moodle's Community Sites facilitate the building of learning communities by bringing developers and instructors together in the same forums and repositories of course materials. Moodle Tracker allows brainstorming of ideas for best practices.

Security and Privacy

In recommending a LMS, we considered that privacy and security needs to be taken into account as the institution is responsible for the protection of their employees and students as well as the data that is collected by the platform. Privacy and Security are two different considerations; Security mainly refers to IT issues and protecting a platform from malicious attacks whereas Privacy refers to both control of access to the system as well as protecting the dissemination of data (Bates, 2015).

In Alberta, legislation (FOIP - Freedom of Information and Protection of Privacy Act) has been enacted to protect Alberta residents' online privacy. Any LMS that will be used at UX will need to demonstrate that it is FOIP compliant. Specifically personal data cannot be collected without consent and information cannot be used for any other purpose other than what it was originally intended (Bates, 2015). Moodle installations are private in the sense that users and access is secure via user accounts and passwords.

There is additional concern about security and privacy based on server location. As many servers are located in the US, concerns regarding the access of student data have been highlighted (Bates, 2014). Moodle's open source code allows for it to be deployed on a private, local, server, ensuring that data remains in the control of UX. Additional features allow for increased privacy such as forced login, hiding user fields and password salting.

Industry Trends and Sustainability

Moodle's sustainability and alignment with industry trends are important considerations. The integration and development of a LMS carries significant time and cost for UX, and it is important to consider the platform's future use vis a vis trends in education as well as the goals of this institution. The growth and inclusion of technologies in the educational space will continue to grow. The needs of tomorrow's instructors and students will change but based on the New Media Consortium's (NMC) Technology Outlook, there are a number of technologies that will likely be used more purposefully within the next five years (Johnson, 2015). One of the major goals in UX's strategic plan is to be innovative and entrepreneurial. Incorporating emerging educational technology tools into course environments will help demonstrate this institution's cutting edge philosophy. Moodle already offers instructors the ability to make use of the following 'emerging' technologies highlighted in NMC report which will facilitate smooth integration into current curriculums (Johnson, 2015):

Flipped classroom. The LMS is central in the deployment of a flipped classroom, acting as a repository for the content learners are responsible outside of the classroom. Moodle's modular format allows organization and integrated assessment.

Learning analytics. Built into Moodle are a number of analytics tools for student, faculties and administration to allow data driven decisions within the learning environment. Moodle developers have created plug-ins to create specific reports to help users analyze data efficiently.

Mobile learning. Moodle is already available on any device allowing learners to not be tethered to a desk or a specific location.

Open licensing. Addressing issues around accessibility and customization, Moodle's open license format allows for manipulation of the source code to fit any user's needs now and in the future.

Badging. Badging allows learners to earn credit for informal learning (NMC, 2015). This practice has been seen to increase motivation in learning (Johnson, 2015). Moodle users can use the pre-existing plug-ins (CourseAwards and GSB) to incorporate this technique into their curriculum (Moodle.net).

As technologies and trends emerge, Moodle's open and adaptive format allows for this platform to stay current ensuring that instructors and learners are able to utilize the best possible pedagogical tools (Moodle.org), which aligns with UX's strategic direction.

Cloud Computing. Cloud-based LMS have emerged on the market. Blackboard recently introduced a SaaS/public choice cloud version of its flagship LMS, Blackboard Learn (PR Newswire US, 2014). The Software-as-a-Service model (SaaS) offers a low-cost, extremely mobile, and personalized learning solution (Dobre, 2014). While the cloud approach offers unique advantages such as no downtime and reduced service interruptions, this is not an option for UX because of privacy regulations, as discussed in the Security and Privacy section.

Taking the Long View

Our team has addressed these issues in our recommendation: Moodle's features and functionality, costs, technical support and product orientation. We recognize that the LMS landscape is changing rapidly with a plethora of products entering the market as new

technologies emerge in an environment that is increasingly volatile, uncertain, complex and ambiguous (Porto, 2013; Bates, 2014). Taking the long view, our consensus is that Moodle presents the greatest potential for innovation and for supporting University X through future challenges. It will help the university avoid likely escalation of licensing and support costs and provide greater flexibility for custom-development and time-efficiencies to meet its diverse and evolving needs. Above all, Moodle will help University X meet its goals to be innovative and to provide accessible and challenging learning environments.

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