From Wikis to Wordpress: How New Technologies Are Impacting the Learning Management System

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LMSs first came on the market around 1996, with the launch of WebCT. This was two years before the appearance of Google, three years before the first Internet-based mobile phone service, nine years before Facebook, ten years before YouTube, and 14 years before the iPad. In terms of Internet technology, LMSs are quite old – some would say "ancient."

LMSs have increasingly incorporated more recent Internet technologies, and also changed their own underlying software with experience over time, but the newer technologies have had an impact on teaching and learning in their own ways.

In this module we look at learning technologies that can operate independently of an LMS (what we will call 'out of the LMS'). However, some of these technologies are also built directly into some LMSs (what we call 'in the LMS'), while others sit outside the LMS but are integrated directly through links from within the LMS (what we will call 'with the LMS'). Thus there is a degree of choice as to how these newer technologies can be used, as we shall see from the examples below. In particular, instructors are increasingly wanting to 'mix and match' different technologies, within, outside and alongside the LMS.

TRADITIONAL WEB SITES

A number of instructors use standard html-based web sites for direct teaching (whether or not their institution had an LMS available). Registering and building a web site has become increasingly easy over the years, requiring relatively little technical expertise, and with a new generation of 'digital natives' entering the faculty ranks, faculty are increasingly developing their own web sites, sometimes getting graduate students to help them, or with help from learning technology support units.

The main use of a web site is usually to supplement classroom teaching. These web sites incorporate other technologies such as YouTube clips, or streaming video lectures from a lecture capture system, or wikis for class discussion. For instance, at the University of Ottawa, Dr. Ali R. Jalani has a web site called iAnatomie to help francophone medical students with their clinical anatomy lectures. This supplements in-class lectures, and includes blog posts from Dr. Jalani, after-class podcasts, and voice over PowerPoint.

Several institutions also use 'open' web sites for student support beyond the classroom. For instance the bi-lingual University of Ottawa has a site (visez juste) to help with writing and speaking skills in French, and a site on training and awareness of sexual harassment. The

University of Ontario Institute of Technology offers open access to www.nool.ca to support writing, maths, and study skills. 'Open' web sites also offer the opportunity for collaboration and sharing in areas where institutions face common challenges.

There appear to be several reasons for developing instructional web sites, rather than using an LMS. Sometimes faculty expressed frustration that the LMS couldn't be easily configured to meet their requirements. In particular, some faculty wanted the web site to be open to anyone, not just students, and/or to be more easily accessible to students than through an LMS. Sometimes (to the frustration of LMS support staff) faculty was unaware that an LMS can easily accommodate what the instructor wanted. Sometimes instructors recognized it was more work, butwere just exercising their independence ('I can do it better myself'). Quality can, in some cases, be an issue with web sites which you can quickly build using templates, with poor navigation and graphics, but often faculty now get help with the design from their learning technology support unit.

However, for many instructors, it remains far easier to use a standard LMS, especially for courses that depend heavily on online learning. Web sites also remain largely an instructor-controlled learning environment (as do LMSs).

BLOGS, WIKIS AND E-PORTFOLIOS

Blogs and wikis are among the most commonly used of all the new technologies in teaching and learning. A blog is a personalized post or set of posts. The 'owner' of the blog controls the content through a password, although there is a facility for readers to post comments (which can also be controlled by the 'owner', to prevent spam or other inappropriate comments).

The Centre for Teaching, Learning and Technology at the University of British Columbia has provided faculty and students with a standardized template for both blogs and wikis, within common online spaces (UBC Blogs and UBC Wikis). This has resulted in an explosion of 'open' web-based content at UBC in the last 18 months, most of it course related. (At the time of writing, late January 2012, there were over 4,500 individual blogs, from faculty, students and staff, within the UBC Blog space). All that is required to set up a blog in this space is a campus-wide Internet login facility (CWL), issued to all students and faculty. As well as using UBC Blog or UBC Wiki, faculty often create their own blogs using WordPress with their own URLs. At UBC some Faculties or Schools (e.g. Business, Education) require every student to have a blog for

course work. (These are not usually fully open to the public though, unlike posts in the UBC Blog). Academic departments often organize the blogs in their area as part of their overall web site (see for instance Latin American Studies).

The UBC wiki states:

> 'Wikis are widely used in education and they allow classes to collaborate and publish writing projects. We see instructors as primary contributors and leaders in this space, but you never know – students could use this space to create or discuss content for the course, inventory old final exams, or write assignments. Just remember, this space is, like the rest of UBC wiki, wide open to anyone at UBC to write and to anyone else in the world to read.'

Currently, nearly 50 departments or programs have their own wikis. Instructors often use the wikis as an essential part of the teaching process, requiring students to participate (see for instance 'The Role of Spectroscopy in Inorganic Chemistry'). In some cases, authorized contributors from outside the university (e.g. academics from other universities), are given access, enabling "sites of excellence" to be developed.

One reason for the popularity of UBC Blog and UBC Wiki is that the content is open and shared, although access to creating content is still controlled through the CWL and a password, thus ensuring quality control and avoiding misuse of the space. Another reason is that many of the UBC blogs and wikis are closely related to the teaching. Although the rest of the course is within the LMS, in some cases the blog or wiki is an essential or required component of the teaching and learning. Generally UBC faculty seemed to think that having the blogs and wikis in an open space worked better for them than embedding them within the LMS.

Another reason why blogs are popular is that they are easy and simple to do within a content management platform such as WordPress (see next section). Wikis require a little more skill and knowledge, but by creating a university-wide support structure for wikis, both faculty and students are given the necessary support to get started. Skill in using blogs and wikis can also be developed though training for faculty and students. For instance, a course in Social Media and Society at Durham College involves students in the creation and revision of blogs and wikis related to social media topics.

An e-portfolio is a personal online collection of information describing, documenting and recording a person's achievements and learning. E-portfolios are used for many different purposes, such as:

- to encourage personal reflection on a student's learning;
- for the exchange of ideas and feedback on a student's learning;
- for evaluating student learning;
- for accreditation of prior experience;
- for continuing professional development;
- to assist a job application; or
- for a certification of competences acquired through a course or from work experience.

The College of Teachers in British Columbia requires all trainee teachers now to develop an e-portfolio (in the case of UBC, they use a standard template in WordPress) for accreditation, although in many other cases, such as in the Scholar Practitioner Program in the School of Nursing at Nipissing University, e-portfolios are created and managed by students for self-reflection and tracking their own progress.

E-portfolios are included in this section because they are created by students, often as a blog or in WordPress (see below), although there are LMS compatible e-portfolio plug-ins, or specialized open source e-portfolio applications such as Mahara.

CONTENT MANAGEMENT SYSTEMS

Content management systems were designed originally to make it easier for departments or divisions within an organization to directly manage the content on their web site, using a standard template. Content could be changed without needing to use a web mark-up language such as html. However, increasingly content management software is being used as essentially a learning management system. The main difference between an LMS and a content management system is that in the latter, the end user (in teaching, the student) also can create or contribute content as part of their learning process.

The most frequently used content management system to support teaching and learning is WordPress, a free, open source system. For instance, ETEC 522, Ventures in Learning Technology, at UBC, is built entirely in WordPress. One reason is that this post-graduate course is largely created by the students themselves (content is in two parts: instructor content, that cannot be changed by students, and student created content). Students are asked to do marketing reports on different technologies, share their work with other students, conduct

polls to identify which technologies look most promising, work in groups to prepare business pitches which are then critiqued by the other students, and finally their 'approved' pitch is then made publicly available as a YouTube video (for an example, see: http://www.youtube.com/watch?v=aEZIVah174g). Often students find new online tools that they then analyze, discuss and use within the course. The instructors (David Vogt and David Porter) claim that conventional LMSs just do not have the flexibility the instructors (and students) need for this kind of course. In particular, it is much easier for students to add, amend and change content as necessary.

TWITTER AND SIMILAR TOOLS

Social media tools such as Facebook and Twitter are increasingly being used for institutional administration and out-of-class student support, and also for informal learning, but there are also areas where these tools are being used for formal instruction. In the Social Media and Society course at Durham College, each student follows a politician on Twitter and comments on how he/she uses it to communicate.

Twitter can be set up to provide instant live comments from students during a lecture, for instance. These can be saved and responded to by the instructor. Comments of course are limited to 140 characters.

UBC 's School of Business has adapted software called Pulse Press to provide private, within class comments using their mobile phones and a Twitter channel:

> 'Your instructor may specifically invite you to post during class, then ask you to review the posts of your classmates with some specific goal in mind, such as voting on posts according to a specified criteria.'

MULTIMEDIA AND WEB CONFERENCING

Multimedia and multiple media

Over the last few years, online learning has moved from a traditionally text-based system supported by limited static graphics or diagrams to a rich, multimedia environment incorporating audio, video, animation and simulations. We have seen that faculty is increasingly using a wide range of different media, such as a web site, audio podcasts, video clips, blogs and wikis, within the same learning environment.

Creating multimedia materials used to be very expensive, but developments in cameras, mobile phones with audio recording, iPods, tablets, and compressed audio and video streaming over the Internet through services such as YouTube and Vimeo have made it relatively easy to create and distribute high quality multimedia over the Internet. For example, VidéoTech is an online library of video clips for teaching and learning French as a second language in post-secondary institutions and secondary schools established jointly by Carleton University and the University of Ottawa. The web site provides French as a second language students and instructors with free access to open source digital video content and exercises that support students in their understanding of authentic, everyday language, spoken French grammar, vocabulary, and pronunciation.

However, in general, post-secondary education has been relatively slow in incorporating multimedia in online learning, compared for instance with the public health service, so there is considerable room for growth over the next few years.

Currently, there is a strong element of amateur production with many educational YouTube videos, or with recordings of one hour lectures that are then streamed. However, highly professional audio-visual materials can be created with the assistance of relatively low-cost production facilities, and more importantly, with help from audio-visual media production specialists. Cambrian College in Sudbury, Ontario, for instance has created a high-end production centre called e-Dome that not only supports faculty but also provides high-end services to local industries, government services and NGOs.

Again, audio podcasting and video streaming normally exist on servers outside the LMS, but can be easily accessed by a single click from within the LMS (or from a web site or content management system).

Web Conferencing

Synchronous audio and video conferencing have been around a long time, but in recent years Internet-based web conferencing has dramatically cut the cost of conferencing. Contact North | Contact Nord's conferencing network is used by many post-secondary institutions in Ontario for distance delivery. Carleton University has developed its own open source web-based conferencing system, BigBlueButton, bringing it into direct competition with Blackboard Collaborate. Both Collaborate and BigBlueButton can be used as a stand-alone conferencing service, or as an integral part of their own learning management systems.

MOBILE LEARNING

Although most LMSs now provide access to their courses, content and organizations on a variety of mobile devices, there is also increasing use of mobile technology, particularly RIM's Play Book, Apple iPods and iPads and other tablets, outside the LMS.

For instance, George Brown College has used a combination of iPods, audio and video podcasts, blogs and e-mails to augment classes for mobile-assisted language learning, using students' own mobile devices. Faculty in the Department of Geography at the University of Ottawa have issued iPads to teaching assistants to facilitate the marking of assignments sent by e-mail in pdf format, using the iAnnotate app for the iPad, then making the marked assignments available to students via DropBox, a cloud computing application that can be accessed via the Internet. Similarly, the Centre for Extended Learning at the University of Waterloo issued 30 tablet PCs to instructors for online marking of assignments, submitted in Word and annotated by the instructors.

Within the LMS, at JIBC (the Justice Institute of British Columbia), all online materials from the learning management system are available on mobile devices for students in the Emergency Response Management program, as the students are working and on the move the whole time. A growing number of institutions are making all their online materials on their LMSs accessible via mobile devices. One major barrier, the lack of standardization between devices, is likely to be overcome with the impending release of HTML5-based browsers in 2014, which will allow one single version of an app for all devices.

The recent launch of Apple's app for textbook creation (iTextbook) which makes the development of learning materials with integrated multimedia as well as grade books and assignments is likely to be a boost to the development of low cost, fast courseware

development, especially given the ease in which such materials can be published at iTunes University.

SIMULATIONS, REMOTE LABS AND VIRTUAL WORLDS

Simulations

Until recently, developing online simulations of equipment or processes was very expensive, and reserved for high cost-training, such as flight simulators. In recent years, developments in both low-cost software (particularly, but not exclusively, Flash) and, equally importantly, in simulation design, have reduced dramatically the cost of developing simulations (although they are still expensive in comparison to developing textual material).

As a result, the use of online simulations and animation is growing in post-secondary education. The Justice Institute of BC states:

> 'simulations of complex real-life events can be presented to students face-to-face or at a distance, analyzed and used to develop sophisticated judgment skills required by leaders worldwide in justice and public safety fields.'

Staff at JIBC has developed a simulation 'framework' called Ex-Pod that allows real-time online simulations of emergency response procedures. Staff at JIBC has also developed low-cost animations and simulations for training paramedicsthat focus on overall management of common injuries and conditions including management of a multiple patient situation.

Durham College has built its ownonline simulations to replicate the machines and systems that apprentices work on in the shop and workplaces. For example, the Fluid Power Trainer learning object can be manipulated in the same manner as the actual equipment, but with the online version the apprentice can try and retry until reaching a level of expertise at his/her own pace. Sheridan College created a simulation of a dog skeleton to be incorporated into the learning management system to respond to both ethical and health concerns about access to cadavers.

The PhET project, based at the University of Colorado at Boulder, is producing high-quality interactive online simulations and teaching materials and making them available for free. Simulations offer students the ability to conduct experiments that may be too expensive or dangerous to do in a physical lab setting. To help students visually comprehend concepts,

PhET simulations animate what is invisible to the eye through the use of graphics and intuitive controls such as click-and-drag manipulation, sliders and radio buttons. In order to further encourage quantitative exploration, the simulations also offer measurement instruments including rulers, stop-watches, voltmeters and thermometers. As the user manipulates these interactive tools, responses are immediately animated thus effectively illustrating cause-and-effect relationships as well as multiple linked representations (motion of the objects, graphs, number readouts, etc.).

Simulations can be embedded within an LMS, or sit outside. In practice, to enable greater sharing (either across different courses in the same institution, or available as OERs), simulations tend to sit outside the LMS on a web server, but can be directly linked to from within the LMS.

REMOTE LABS

Remote web-based science labs use software and a robotic interface to allow students to work in groups as they use their Internet browser to access and control actual lab equipment and perform lab exercises in real time while obtaining real-world data. North Island College and the College of the Rockies in British Columbia have developed remote labs in physics, chemistry and biology.

The Colorado Community College system is introducing a combination of simulations, remote labs and home kits across its 13 colleges for teaching first and second year undergraduate physics at a distance, in partnership with BC colleges.

VIRTUAL WORLDS

Virtual worlds are complex digital environments that allow participants to project a non-physical presence of themselves - an avatar - into a generated three-dimensional reality, and within that reality to interact with other participants. Users can build and modify this world to a large degree. Second Life is the best-known virtual world application.

Loyalist College in Ontario started working in Second Life but is now developing its own virtual world environment using the Unity 3D authoring tool. It has created a simulation of a customs and immigration border post for training Canadian border guards and college students, a virtual hospital for virtual tours by secondary school students, and a virtual food processing

plant for mechanical engineering students. Carleton University has built a virtual version of its campus in Second Life, for teaching archaeology and for English-as-a-second language learning.

By definition, virtual worlds sit outside an LMS.

CONCLUSION

New developments are occurring rapidly, with many academics not waiting for their institution to agree on an LMS or acting independently of such a system if one is in place. Innovation occurs through such developments, though they have an implication for learners (they need to master an increasing number of web-based systems) and the institution (brand, security, privacy). There is a fine line to find between encouraging and enabling innovation and ensuring consistency and security: it is likely to be an ongoing challenge.