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"The Best Thing Created Since Sliced Bread..." – Our Journey Toward Blended Learning

Aisha Wood-Jackson, M. Ed.
School of Education
The University of the West Indies
St. Augustine Campus
Trinidad and Tobago, West Indies
aisha.wood-jackson@sta.uwi.edu

Chérisse Mahabir
Campus IT Services
The University of the West Indies
St. Augustine Campus
Trinidad and Tobago, West Indies
cherisse.mahabir@sta.uwi.edu

Lindsay John
Campus IT Services
The University of the West Indies
St. Augustine Campus
Trinidad and Tobago, West Indies
lindsay.john@sta.uwi.edu

Abstract:

From 2001 to the fall of 2006, the lecturers and students of The University of the West Indies, St. Augustine Campus, Trinidad and Tobago, used WebCT, a commercial web based learning management system (LMS), to prepare, manage and deliver learning content and resources to students. The low level of adoption and high cost of the license led University Administrators to question the benefit to cost ratio. A committee was formed to compare open source LMSs (Moodle, Sakai, and Angel) to WebCT and based on this data, recommend a LMS for the St. Augustine Campus. Based on their review of the pricing, hardware/software requirements, communication tools, productivity tools, opportunities for student involvement, administrative tools, course development and curriculum design features, the committee chose to adopt Moodle. This paper will describe our Moodle implementation strategy and will reflect on the issues as well as successes arising over the last two years.

Introduction

The University of the West Indies (UWI), established in 1948, is the oldest institution of higher learning in the Caribbean. The UWI serves more than 39,000 students across four campuses in Barbados (Cave Hill), Jamaica (Mona), Trinidad and Tobago (St. Augustine), the Open Campus and twelve centres across the Caribbean. Although

governed by the Vice Chancellor's Office in Jamaica, each campus Principal has the responsibility of operationalizing the University's goals as outlined in the University's Strategic Plan. In the 2002-2007 strategic plan, UWI developed nine strategic objectives two of which, Student Centeredness and Information and Communications Technology, outlined initiatives related to educational technologies on the campus including:

- Providing students with a more technology-enriched learning environment
- Achieving more widespread use or infusion of IT in enhancing teaching and learning effectiveness
- Providing support for academic staff to gain competence in the application of the new technologies to programme delivery.

It is in this context that the insights presented in this paper developed.

From 2001 to the fall of 2006, lecturers of The UWI, St. Augustine Campus used WebCT Campus Edition (CE) 4.1, a web based learning management system (LMS), to provide administrative support to students in face-to-face courses by providing a space to publish and distribute course content, communicate with students via e-mail and discussion forums, administer quizzes and record and display grades. WebCT was also used to support the award winning, international, fully online Master's degree programme in Telecommunications Regulation and Policy.

Despite the benefits WebCT provided, adoption was slow. Non-technical lecturers found the system complex and the week-long training tedious. Following the training, lecturers had to meet rigorous guidelines, usually required for fully online programmes, before the course could go live to students. WebCT's adoption was complicated by a lack of staff dedicated to support both student and lecturer use of the software. Additionally, WebCT's approximately \$40,000 U.S.D. per year to license was a considerable financial cost. The low level of adoption and cost of the license led campus administrators to question the benefit to cost ratio and prompted them to request a review of open source LMSs by Campus Information Technology Services (CITS).

LMS Review Process

The LMS review team was led by the Director of CITS who assembled a committee comprising of members of the academic community with experiences using learning management systems. These members included lecturers, the Director of the Instructional Development Unit, the campus Educational Technologist, the LMS Systems Administrator, and other members of CITS staff. The LMS team reviewed WebCT CE 4.1, WebCT CE 6.0 and two open source LMSs – Moodle 1.5., Sakai 2.0, and Angel.

To aid in the decision making, the review team used the EduTools website (2008) which provides detailed descriptions and ratings of the teaching, learning, and administrative features of several LMSs. The data suggested that the St. Augustine Campus should not only continue with WebCT but upgrade to CE 6.0; however, the advantages attributed to open source LMSs, specifically licensing fees, customizability, opportunities for continuous improvement and the user friendliness ascribed to Moodle, out weighed the difference between the two.

Establishing Moodle on the St. Augustine Campus

The eLearning Team was charged with migrating the campus to Moodle and was made up of the campus Educational Technologist, the System Administrator, an eLearning Support Specialist and an Administrative Assistant. The team decided to integrate Moodle in three phases.

Phase I - Infrastructure

The first consideration for our Moodle implementation was determining its platform infrastructure. With a projected increase in the number of courses with online components, and the need for a platform which would deliver chat and quiz functionality without degrading performance, we sought advice from two of our "sibling" campuses and the Moodle online community at Moodle.org (2008). The most suitable topology recommended was a multi-server instance of Moodle which would facilitate load sharing for consistent performance, redundancy for high availability, and scalability for future growth.

Four servers were procured for our Moodle instance. The operating system, Linux, was chosen over Windows because of the performance benefits as advised by Moodle.org (2008). Although the campus did not have a dedicated Linux expert, training material and support were readily available online. The move from a Windows environment (which WebCT ran on) to a Linux environment was thus not difficult. Load balancing was done at the software level using Ultra Monkey (2005). The “Streamline High Availability and Load Balancing” topology was chosen since it required fewer servers to implement.

Additional tools were implemented and settings optimized to enhance Moodle’s performance, as recommended by the performance guide available on Moodle.org (2008). After setting up our instance of Moodle, a web analysis tool, YSlow, was used to rate web page performance. YSlow’s reports are based on the *Best Practices: For Higher Performance Websites* (Yahoo Development Network 2008). Recommendations then followed.

Phase II – Course Migration

In order to gain buy-in from faculty members who had used WebCT in the past, we converted each WebCT course to Moodle using processes outlined on Moodle.org (2008). Courses going live in the spring of 2007 were given conversion priority as were those that did not use quizzes in WebCT. Delaying the conversion of courses with quizzes was done because the Moodle.org (2008) community noted that WebCT quizzes did not always transfer correctly when placed in Moodle. When this process was tested, we found that the quizzes had to be rebuilt. This tedious process would take considerable time away from other courses, the majority of which only used WebCT to distribute course material. We extended the WebCT contract for 1 year to cater for any delays and all new courses for the spring were developed in Moodle.

Phase III – Customisations and Faculty Adoption

Moodle facilitates interface customisation through design themes. With assistance from our Web Development Team, a theme was adapted to incorporate UWI’s style standards, the University crest, webpage headers, footers, and colour schemes. Moodle was also renamed to myeLearning so that it would fit with the brand of the campuses’ other online systems including the student portal (mySTA), e-mail (myEmail), Banner (mySecureArea), course schedules (myTimeTable), and important links (myLinks).

By the launch of Moodle, the campus had migrated to the Banner student record system. Initially, student data were uploaded manually into Moodle but as the campus integrated all of its online systems through Active Directory (AD), this process was automated. Like other open source software which have the benefit of flexibility, integrating Moodle with AD was a simple task as the required plugins were already available in Moodle and easy to configure. This integration included centralised authentication, allowing users to access various applications with a single username and password.

In his book, *Diffusion of Innovation*, Everett Rogers (1995) describes the characteristics of innovations, as perceived by individuals, which helps to explain their rate of adoption. These characteristics provide a lens in which to describe the strategies we used to assist faculty in adopting Moodle. The first characteristic, relative advantage, is to what degree the individual finds the innovation as advantageous as compared to the previous innovation available to them. The relative advantage of Moodle was considered during the LMS evaluation process. As discussed above, lecturers struggled with the technical skills and stringent policies and procedures required to use WebCT. Moodle had the advantage in that it was easier to use. We also adjusted the policies and procedures so that they gave lecturers more power over their courses and reflected standards more appropriate for a blended course rather than those of an online course.

Compatibility speaks to the perception that an innovation is consistent with an individual’s values, experiences, beliefs, and needs. Because the lecturers were familiar with LMSs, they were less uncertain about how it could be used to support their teaching. As we conducted one-on-one, small group, large group, and department specific sessions to prepare lecturers to use Moodle, we used the areas of compatibility with WebCT in order to demonstrate what was consistent between the two LMSs, the limitations of WebCT, and the possibilities of Moodle. An additional strategy, reflective of the compatibility characteristic, was offering training sessions tailored to meet specific departmental needs rather than offering generic sessions.

Complexity describes “the degree to which an innovation is perceived as relatively difficult to understand and use” (Rogers 1995 p. 242). Moodle’s interface was intuitively designed, as such, it was less complex to adopt than WebCT. The process of a course going live was also made less complex by adjusting policy and procedures as described above. Additionally, a variety of support structures were put in place to assist lecturers who might have perceived Moodle as being complex. We instituted an open door policy which Faculty used for quick questions and for more indepth knowledge on particular features. Also important to aiding Faculty in adopting Moodle was our phone and e-mail strategy. We committed to addressing issues communicated by phone or e-mail within 24 hours. We also developed *myeLearning101 for Lecturers*, a support course within Moodle, which provided them with links to documents, a help forum, and readings related to using technology to support teaching and learning.

Another of Roger’s (1995) characteristics, trialability, requires change agents to provide opportunities for the innovation to be experimented with, on a limited basis, so as to dispel uncertainties about the innovation. Late adopters were encouraged to start small (perhaps only uploading course documents) before using Moodle’s more advanced features (such as the wiki). Additionally, faculty members were not forced to use Moodle, it was always optional. Many times individuals came to training, asked for a course shell, and did not adopt for some time. We introduced an after training follow-up strategy to help ease lecturers such as these into trying out the LMS.

The final characteristic, observability, was facilitated by our early adopters. Observability is “the degree to which the results of an innovation are visible to others” (Rogers 1995 p. 244). As our early adopters used Moodle within their departments, they shared it with their colleagues, helping to encourage adoption. We also hosted EdTech Talks, which were presentations by Faculty members on their various uses of Moodle. These talks included topics such as using Moodle to facilitate 360° feedback, discussion forum strategies, and wikis. To encourage attendance by non-Moodle users, we invited participation through campus wide marketing. We also targeted current users (early innovators and laggards) through Moodle’s messages and forum tools. Ensuring that lecturers development reflected Roger’s characteristics of innovations allowed for Moodle’s quick rate of adoption.

The St. Augustine Campus’ Student Body

Nontraditional, mature, part time students with full time jobs make up 34% of our student population (Office of the Campus Registrar, 2007). Due to the outdated, manual processes still in place in many workplaces, the majority of them are not exposed to modern technologies and are also digitally illiterate. Due to the unavailability of inexpensive information and communications technologies (ICTs) in Trinidad and Tobago, traditional students are generally not digitally literate as well. In most primary and secondary schools, the practice of integrating technology is currently developing, thus the skills of entry level students are minimal. In a 2007 CITS survey (Ramjattan 2007) of 722 incoming students, 9% indicated that they owned a laptop and 39% had access to a computer at home. Further, 31% of students reported that they had access to the Internet on dial-up, 8% used DSL, and unfortunately, 61% had no access. With the increased awareness of the benefits of the Internet, competition between internet service providers, and discounted computer loans offered by the University, ICTs are becoming more affordable.

The eLearning Team implemented several strategies to combat some of these challenges. A support course, *myeLearning101 for Students*, was developed to provide system requirements, documentation and instructional videos. It also contained links to free software, troubleshooting topics and a help forum where students could post queries or seek solutions if a problem was already encountered. We also created an e-mail account which students could send queries to as well.

In the spring of 2008, we implemented the Student Mentoring Programme where tech-savvy students were hired to conduct in-class, Moodle demonstrations. To prepare student demonstrators for this task, they participated in a two day training session on the use of Moodle. After training, the demonstrators were scheduled based on their availability and lecturers’ requests for the in-class demonstration. They were required to follow up on any questions that arose during their demonstration to ensure that students fully comprehended the use of the system and they became advocates for technology on the campus.

We also trained other student support groups, including the Student Advisory Unit and computer lab technicians, so they could assist students with accessing Moodle, answer their frequently asked questions, and point them in the direction of additional support. Additionally, we successfully lobbied for extended hours for Student Advisory Unit Staff in order to facilitate Evening University students.

Making Moodle our Own

During professional development sessions, we encouraged faculty to not feel restricted concerning the features available in the native Moodle package but instead consult with us about how to get their administrative and pedagogical needs met. This helped to transform Moodle use from one of distribution of course materials to a blended approach where students used Moodle in their face-to-face courses to participate in a variety of online activities. Further, as lecturers became more familiar with the system, they made recommendations concerning features they would like implemented. For example, the following modules were added.

- Attendance – Online attendance register
- Book – Displays online content with a table of contents
- Course Request – Allows lecturers to request a new course shell
- DragMath – Allows the use of Mathematical symbols and expressions in the HTML editor
- Questionnaire – Survey tool which allows anonymous responses
- Turnitin – Integrates Moodle with Turnitin through the assignment activity
- Upload Grades – Allows lecturers or tutors to batch upload grades to their course
- Spell Check – Allows users to check their spelling in the HTML editor
- PodCast – An interface that allows users to view, upload, comment on, and track podcast usage

As the popularity of Moodle increased, it was also customised to facilitate non-traditional functions. Although booklists for courses and programmes were available in the library and within departments, some administrative staff wanted students to be able to access the booklists in Moodle. One innovative lecturer wanted to provide students in the programme with an opportunity to network, collaborate, and be mentored by their peers who had previously taken the course. Metacourses were used to facilitate this request by allowing students to not only access courses they were registered for but also the other courses the lecturer taught. Metacourses also allowed departments and programmes to have dynamic, Moodle webpages to distribute information and communicate with all the students within a programme. The choice tool, a one question poll which captures student's ideas about a particular topic, was also retooled to assist in the management of tutorial and lecture selection and writing center appointments.

Student and Lecturer Feedback

The quote used in our title, "The best thing since sliced bread" is illustrative of the feedback we received in the qualitative feedback collected in a questionnaire we used to measure student and lecturer satisfaction with the strategies we adopted to address their needs. The anonymous surveys featured likert scale (agree, neutral, disagree, and not applicable) and open ended questions and were placed in *myeLearning101 for Students* and *myeLearning101 for Lecturers*. We advertised through the messages and forum tools in Moodle. 323 students responded to the student survey while 52 lecturers responded to the lecturer survey. Preliminary results are shared below.

We received the most overwhelming data supporting our adoption of Moodle when 84% of students surveyed reported that they found Moodle easy to use. Only 6% disagreed and 10% were neutral. Lecturers agreed as well with 87% reporting ease of use, 2% disagreed, and 12% were neutral.

Overall 90% of students surveyed found Moodle to be responsive; however, 10% found it slow. The 10% was equally divided between those who were accessing the system from dial up and high-speed connections. This might imply that these students may have problems with their individual systems that might have affected the responsiveness of Moodle. This data is consistent with lecturers as 98% of them reported that Moodle was responsive.

Unfortunately, only 4% of students surveyed indicated that they used *myeLearning101 for Students*, 34% were neutral about its usefulness and 41% were unaware of its existence. Although it is not used as frequently as we might like, when compared to student's responses about Moodle's ease of use, there was no link between the two. While this data suggests that *myeLearning101 for Students* does not seem to be useful, 21% of students surveyed reported that they used the page. As such, we will continue to develop and expand its advertising as Moodle evolves.

80% of lecturers found that they received timely and thorough assistance when they requested pedagogical and technical support while 20% were neutral. 40% used *myeLearning101 for Lecturers* to locate support documents, 52% did not, and 8% were not aware of its existence. As with students, when this data was compared to ease of use, there was yet again no link.

Of those that forwarded their queries to the Moodle help email, 36.6% of students agreed that the support provided was timely and thorough, 23.8% were neutral, 32.2% indicated the question was not applicable and 7.4% disagreed. When asked about the help forum available in *myeLearning101 for Students*, 35% of students using the service felt it was timely and thorough, 58% were neutral, and 7% disagreed. This data suggests that students using the services are satisfied with the speed and quality of technical support we provide however many of them still do not use the resource.

Students were asked whether the demonstrations provided as a part of the Student Mentoring Programme prepared them to use Moodle. 38% agreed and 14% disagreed; however, this data suggests that the mentoring programme may need to be expanded as the majority of students were neutral (25%) and found the question not applicable (23%).

When asked about their preferred training format, 40.4% of lecturers indicated that they preferred small group training sessions organized to meet their specific department needs followed by one-on-one consultations (23.1%), half day sessions (15.4%), self-study using the documentation available in *myeLearning101 for Lecturers* (15.4%), and day long training sessions (5.7%).

The data related to lecturer satisfaction with the EdTech Talks series suggests that we have to consider the availability of lecturers on dates scheduled, advertise more efficiently and also hold the sessions more often as 42% of lecturers found the sessions enhanced their learning, 2% disagreed, and 56% were neutral.

Students indicated that the following tools in Moodle, enhanced their learning the most: 1. Uploaded readings, 2. Links to websites, 3. Quizzes, 4. Screencasts, and 5. Discussion forums. Lecturers reported that the following tools were the most used in their courses: 1. Uploaded PowerPoint files, 2. Links to websites, 3. Discussion forums, 4. Uploaded readings, 5. Screencasts and quizzes. Lecturers also indicated which tools they wanted to know more about. The most requested were: Screencastings, podcasts, wikis, workshops, and the quiz tool.

Conclusion

Our data has shown that the implementation of Moodle on our campus has been successful. Listening and acting on suggestions, frustrations, successes experienced by lecturers and students played a critical role in integrating Moodle on our campus. Further, monitoring Moodle's performance and making decisions based on it has also been important in the evolution of the system. In order for Moodle to continue to meet the needs of our University strategic plans, there will need to be continued investment in staffing, training, and development.

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