The Use of Lotus Notes® as a Comprehensive Learning, Evaluation, and Production System

David Annand
davidd@athabasca.ca

Colleen Huber
colleenh@athabasca.ca

Kerri Michalczuk
kerrim@athabasca.ca
Athabasca University
1 University Drive
Athabasca, AB
Canada T9S 3A3

Abstract
The evolution of a completely online learning and administrative environment in the School of Business at Athabasca University, a distance-based Canadian university, is described. Over the last eight years, successful implementation of information technology in five areas has resulted in improved student service, cost reductions, and more efficient administrative processes.

Many of the elements described in this article can be reviewed at http://eclass.athabasca.ca/

Key Words
automation, online learning, exam system, virtual classroom

1. Introduction
With the widespread adoption of technology-based distance learning, the organization and management of learning - rather than technological and pedagogical issues - are the principal challenges that need be addressed for effective learning to occur [1]. Mature distance education consists of reorganizing educational resources into a total delivery system, not adding new technology to old ways of organizing teaching and learning. The organization of learning needs to reconceptualized in order for educational institutions to deliver low-cost, high quality education to a wide variety of learners, in a sustainable organizational structure [2].

This paper describes how learning has been reconceptualized within the School of Business at Athabasca University. Its paper-based, telephone-supported distance learning system has evolved into an integrated, online learning and administration environment over a period of approximately eight years. The School has funded a significant part of this innovation from cost reductions associated with the introduction of new enabling technology.

Athabasca University is located in Alberta, Canada. Its mission is to reduce barriers that traditionally restrict access to university-level education for all adults. To accomplish this, it has adopted open access policies – for instance, offering distance education courses, admitting any adult regardless of prior education, arranging comprehensive transfer credit arrangements with other educational institutions, and pioneering work in prior learning assessment for university credit.

For the most part, students study independently and at a distance. They can start courses at any time during the year and complete these at their own pace within a six month contract period. Instructional material traditionally has been provided in a self-contained course package, along with assessment material and a detailed explanation of how to complete the course. Individualized academic support is most often provided to students in the form of telephone and e-mail support from full-time faculty or part-time tutors. The University’s undergraduate business courses account for about 13,000 annual course registrations, or over 1/3 of the University’s total undergraduate registrations. At present, there are about 25 full-time faculty members and a number of part-time markers and academic experts, as well as about 20 full-time professional and student support staff.
The University’s level of government funding is based on how well it meets certain key performance indicators like number of graduates and percentage growth. The University has done well under this funding arrangement – undergraduate enrollments have grown more than 25% compounded annually over the last three years, and graduate programs even more – but state funding is not tied proportionately to growth in enrollment levels. As enrollments increase, the University receives a smaller percentage of its total revenue from government and becomes more reliant on tuition fees. Operating grants have shrunk from about 78% of total revenues to under 50% in just six years. Increasingly, innovation must be demonstrably cost effective in order to be supported and adopted across the institution.

2. Genesis of the Online Learning System

For many years, and in common with the rest of the University, learner support was provided to School of Business students by academic tutors. These tutors were generally available by telephone in three-hour blocks once per week. The School of Business introduced the ‘Call Centre’ concept in 1994. The Call Centre was designed to improve service to students and reduce instructional costs, since payments to telephone tutors were one of the Centre’s largest expenses. Under the Call Centre model, students in any course are able to call a toll-free central telephone number five afternoons and six evenings per week. The Call Centre now provides about 60 hours of telephone assistance each week to students.

Students first speak with ‘facilitators’ rather than directly to academic tutors. The facilitators handle a number of routine queries from students. When the facilitators are unable to help the students, their questions are referred to academic experts for resolution. These academics then contact students directly. In this way, academics field only substantive course-related questions or problematic administrative issues.

The Call Centre concept has allowed academics to use their time more effectively, primarily by eliminating routine queries and by increasing the average number of students assisted per staff member. Each facilitator now handle calls from about three times as many students per week as an average telephone tutor previously did. As a result, student support costs have been reduced by approximately $70,000 annually in the Centre’s undergraduate independent study courses. The cost savings enabled the concurrent development of a “Callback Conference.” This Lotus Notes database allows facilitators and academics to track and resolve student queries online - a necessity once student support was spread among academic and support staff.

Despite the success of this enabling technology, further development is planned. Currently, the ability to track student queries is limited to those that are forwarded to academic experts by facilitators via the Callback Conference. This only accounts for approximately 20% of student contacts. A comprehensive Notes-based student tracking system is under development that will track all queries, whether by email or telephone, and allow a wider range of student contacts to be recorded. It will be web-enabled, thereby allowing facilitators, academics and other University staff to access the database from virtually anywhere using a standard web browser. The database will also be able to produce reports and statistics regarding student contacts.

3. Evolution to the Online Learning System

The development of the Call Centre, and in particular the information system infrastructure needed to support it, provided a ready-made platform for the creation of an electronic student learning environment. In 1998, and based on much of the same Lotus Notes technology used to develop the Callback Conference, an online, individualized learning environment was created. Previously print-based study guides, assignments, and other instructional materials used in School of Business courses were digitized and linked electronically. This learning system has been gradually enhanced with links to external sites, computer-based instruction modules, video clips streamed from publishers’ websites, and electronic textbooks. Individualized assignments can be created, submitted, and marked electronically. Students can access library information, marks, and modified versions of the Call Centre’s ‘frequently asked questions’ databases for each course.

Initially, students used Lotus Notes client software to access this information. This was desirable, as students could replicate (send and
receive updates to their materials as well as e-mail, for example), then disconnect and work offline to reduce connection time and costs. However, since most students in the School of Business enroll for only one or two courses, the cost of providing technical support for the Notes client software gradually became prohibitive. With the introduction of Lotus Notes 5.0, web enabled courses began to replace the earlier learning system. Students can now access courses with just an Internet connection and standard web browser. This has produced a significant decrease in the amount of technical support for students, saved money, and given the course development and technical team more time to enhance the online learning system. Staff within the School of Business continue to use Notes client software to develop and maintain courses.

4. Evolution to e-Class®

In common with most courses offered by Athabasca University, students who use the School of Business web-based learning system can start their online courses at the beginning of any month and proceed through them at their own pace. However, in September 2000 a new mode of online study was introduced, referred to as e-Class. Much like classroom counterparts, e-Class students proceed as a cohort through fifteen-week courses that begin on a specified date in September and January. These courses have set due dates for assignments and exams. The instructional design has been altered somewhat to encourage greater interaction among learners and between learners and instructors. The e-Class platform also has the following features:

1. The e-Class homepage is the portal for all e-Class students. This is a personalized page where students can sign in, view the courses they are enrolled in, link to resources used within their courses, contact the Call Centre, register for online exams, and chat with other e-Class students.

2. There are standard navigation features for each course, to provide a consistent look and feel for students.

3. Certain types of web pages are also common to each course:

   - a Bulletin Board allows each instructor to post information about a specific course. These might include reminders about assignments, optional learning resources, and other information the instructor would like to share with students.

   - students read a Getting Started page before they begin their studies. This describes their learning resources, the course schedule, the function of the Call Centre, rules of academic conduct, and any other important information about the course.

   - students can enter personal information that they are willing to share with others in Personal Profiles.

   - a Contents page tells students what reading and learning activities need to be completed, and when.

   - Assignment pages describe assignment contents and provide information about writing exams.

   - Course FAQs contains answers to frequently asked questions. Students can also submit questions to academic experts if they are unable to find answers in the FAQs.

   - the instructor and students can discuss group topics in a Discussion page. Types of interaction in theses computer conferences include formal debates, discussion of group assignments, and general discussions among participants.

Because of the perceived benefits of online learning, School of Business faculty desired to continue the development of its electronic learning environments. However, as noted in relevant distance education literature, budget limitations increasingly constrained the ability to introduce additional electronic learning enhancements [3]. Faced with these economic constraints, the School of Business in mid-2000 began to re-examine all of its administrative processes, not just those normally associated with teaching activities. The primary objectives were to provide a more satisfying online learning experience for students, while increasing efficiencies and reducing costs even across various sub-units within the University. The most promising area for improvement, it was concluded, was the examination process.

5. The Online, Automated Exam System

Prior to 2001, all online learning activities in most School of Business courses could be done electronically, except one. Paper-based exams were still used. Besides inconveniencing some students who were used to working onscreen, the
system also incurred significant marking, postage, and clerical costs, and time delays. In January 2001, the School of Business hired a contractor to develop a Lotus Notes-based electronic exam handling and administration system. This system was designed to automate or simplify the process of handling exams from generation to recording of the final mark in a student record database, while still using the existing University invigilation network and exam processes. Extensive consultations about system design and functionality were carried out with School of Business and Registry Services staff. The initial phase of the system was completed in April 2001.

For ease of handling and security reasons, exams never leave the server they are housed in. Four to six complete exams are written for each course and stored in the online examination database. All student responses as well as faculty exam marking activities are completed within this secure database. The need for re-entering student information is eliminated. When a student completes a web-based exam request form, information like exam name, course, instructor, student name, date of exam request, and date of writing are automatically entered into the online exam system.

Five electronic “forms” enable support staff to administer the online exam system. These allow them to maintain the exams, manage student and invigilation instructions and confirmation letters, track the progress of individual exams from authorization to the recording of exam marks, support the actual online exam process, and notify requisite staff members of changes in the status of an exam during the process (for example, the appropriate School of Business course assistant and marker are notified when a student completes an exam). These forms and other “backend” administrative functions are all maintained using Notes client software, though students write the exams using a Web browser.

Exams can contain multiple choice, true/false, short answer, and essay questions. All multiple-choice and true/false questions are automatically marked. If the exam contains any written responses, e-mail is automatically sent to the specified marker with a link to the actual exam. For ease of marking, solutions to the questions are provided for the markers on the same screen as the students’ answers. The final mark is automatically sent by e-mail to the student and the academic course assistant. The course assistant records the mark in the University-wide student tracking system. Plans are underway to automate this function as well.

The system has been tested in several individualized homestudy courses with average enrolments of about 200 students per year. It has met with almost universal acceptance by students and staff. The ability of the online exam system to automate administrative processes and therefore ease demands on staff in both the School of Business and Registry Services has been key to its successful implementation. Plans are underway to extend the online exam system across the University.

6. Current Developments

The next phase in the evolution of the School of Business online learning system involves revamping the course production process, and eventually eliminating paper-based instructional material. In the past, Athabasca University committed to providing students with both print-based and online versions of the same course. To minimize duplication of effort, the instructional design of online courses was very similar to that of paper-based counterparts. Anticipating the recent-announced change in strategic direction for the University as a whole, the School of Business as of January 2002 has decided to redesign its courses and adopt online instructional design and production principles from the outset. Eventually, paper-based materials will be produced from these online materials only when specifically requested by students.

This decision has had significant ramifications for both design and production of School of Business courses. To facilitate this change, its technical team has been working on new editing and instructional design policies and procedures. For instance, Microsoft Word® is now used by authors because it is ubiquitous and its review features allow for easy editing and final author review.

A script is being developed that will extract text from Word into various Lotus Notes databases, or insert this into a print-ready template. This will eliminate the need for Lotus Notes databases, or insert this into a print-ready template. This will eliminate the need for paper-based material to be translated into the University’s standard publishing software, then re-formatted and re-edited. Redesign of online materials will reduce the amount of text and allow revisions to be made more easily. More emphasis will be placed
on developing reusable learning objects, as well as use of e-books and online library resources.

7. Conclusion

Significant changes in the business processes employed by the School of Business over the last eight years have resulted in increased efficiency, cost savings, and improved student service. These benefits have allowed the School to evolve into a provider of interactive, online learning, while maintaining many of the cost efficiencies associated with traditional distance education.

The ability of information technology to improve services by streamlining and automating various learning and administrative processes has been a key to their successful implementation. As with any innovation, continuing discussions with the University community is necessary for widespread adoption of many of these processes. This will likely prove to be a major challenge for the School in the future.

References

