Learning from a Pilot Project to Put a College IT Curriculum Online

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ABSTRACT

Learning resources for the Business Information Technology program at a community college in eastern Canada were moved onto an online platform. The cluster of courses taught by eight learning managers at two separate campuses as well as by distance was heavily revised, reformatted and migrated to WebCT™ on a project time line of only six months. We examine the ways in which this process was a success, why difficulties arose and what strategies were put in place for future development.

Tensions developed among project participants not just because of difficulties with planning and management but also owing to an underlying question about the pedagogical value of online teaching tools in the classroom. We conclude that staff commitment may come easily when an online platform is proposed to improve curriculum management and consistency. This is particularly true when appropriate incentives and supports are provided. However, change is more difficult when it impinges on a teacher’s self-image and pedagogical principles. This type of cultural shift requires more prolonged, participatory processes.

Keywords
Change process, Online learning, WebCT™

Introduction

The changing world of tertiary education

A major challenge for tertiary institutions is adjusting to change as the use of digital technologies in education rapidly expands (Bates, 2000; Duderstadt, 1999). Although institutions, faculty and students have an interest in putting post-secondary courses online there are hurdles to successful implementation (Jennings & Dirksen, 1997). Documentation and evaluation of the process of online migration helps innovators to learn from and improve these processes.

The pedagogy of the Web is evolving, and various models for implementation of web-based instruction are proposed (Ellsworth, 2000; Reeves & Reeves, 1997). It is a complicated task to put a course online. There are associated disincentives and incentives for faculty (Wolcott & Betts, 1999). Teaching faculty may resist because of a concern that an online teaching environment lacks “shared social construction of knowledge” or out of fear of change in their teaching approach (Berge, 1998; Graves, 1998). Ellsworth (2000) notes that technological innovation in education has failed to live up to predicted impacts owing to unexpected resistance and ineffective response strategies. Fullan (1992) suggests that innovators must consider the complexity of an innovation, points of consensus and conflict, the dimensions of change for teachers (e.g., new materials, new activities, and changes in underlying beliefs) as well as learning outcomes for students.

This paper documents the process of moving the course contents of the Business Information Technology program at a community college in eastern Canada onto an online platform, WebCT™. This process was ultimately a success, but difficulties arose which prompted changes in the approach to subsequent development.
Study site

The community college offers diverse career training. Following a competency-based educational approach, instructors (who are called learning managers) facilitate each student’s learning experience by assigning individual and group project work that employs skills currently required in the workplace. Learning managers collaborate with students to evaluate the outcome, rating not just the demonstrated technical skills but also those “soft skills” related to teamwork and client service. Instructors are available to their students 5 days a week. They also have responsibility to update their course contents following periodic reviews by industry advisors.

The learning managers typically come out of industry. Most lack specialized training in education and curriculum development. The community college provides instruction in education theory to the teaching staff through its Learning Management Program.

The motivation for institutional change

To remain competitive and attract working and home-bound students, the college seeks to modernize its image and provide more flexible delivery of courses. The strategic development plan calls for the majority of programs to be moved to a standard online platform. The college anticipates marketing and purchasing online learning materials, brokering courses for other institutions and attracting virtual staff. Online teaching tools will be used to enhance in-class teaching and a greater number of courses will be offered through distance education. Because this represents a profound change, they decided to start with a pilot project.

Of all the commercial platforms considered, none provided a suitable database for tracking student competency ratings. WebCT™ was chosen because its open architecture allowed for development of the required functions. Also, there was comfort in adopting a widely-used platform and WebCT™ was a relatively low cost option.

Selection of the pilot project

In 1998 the Business Information Technology (BIT) program was selected as the pilot. BIT courses are offered on two campuses and part of the program has been available through distance education since 1995. On campus, instructors use one-on-one teaching, lectures, tutorials and laboratory exercises. BIT was selected as the pilot for online migration because of need and opportunity. There was a need to standardize the course on the two campuses and in the distance stream and to facilitate curriculum maintenance. Demand for the distance option was growing and the delivery system needed to be revamped. Finally, the BIT learning managers seemed an ideal group to pilot learning technologies because of their familiarity with computers and the Internet.

Methods

Written questionnaires and semi-structured interviews were developed in consultation with a committee that included administrative staff of the college. Learning managers were also consulted to ensure that questions of interest to them were included.

In spring and summer 2000, questionnaires were distributed to all BIT students who had been exposed to the online curriculum up to that point. These students had moved from a paper-based curriculum in year one to online curriculum in their second year, 1999-2000. Questionnaires were also administered to the 8 BIT teaching staff, 10 curriculum support staff and 3 upper level managers who made decisions around college and program development. The questionnaires provided data on demographics, computer experience and attitudes to technology. Students were also asked to rate 19 indicators for year 1 and year 2 of their program, using a ladder scale of 1 to 10. The indicators related to access to resources, infrastructure, quality of learning materials, learning management, and so on. The aim was to determine whether they perceived any significant differences after their courses went online. The questionnaires were sent through e-mail to all 57 graduating students; 14 responded. Ratings for indicators in years 1 and 2 were compared using a paired t-test.

The in-depth interviews with BIT learning managers documented the development process and how the use of the platform affected both teachers and students. A different but overlapping instrument was used to interview curriculum support and management staff. At the time of the interviews (June-July 2000), the revised learning materials and new teaching tools had been available online for one complete academic year. Data from the
various perspectives were cross-checked, the steps in the process were reconstructed and perceptions of the impacts were compiled. Results were returned to all respondents for review and validation.

**Results**

**Demographics**

The majority of BIT students who responded to the survey were males (64%) in the age range of 20-29 years (69%). These students had 2-11 (average 6) years of computer experience. All owned home computers. The learning managers fell mostly in the 30-39 year age group, and six of the eight were male. All had either an undergraduate degree or college diploma and, on average, 16 years experience with computers. The majority (5) described themselves as happy to work with computers, while three were always looking for new ways to work with the technology. Most (62%) considered themselves very experienced computer users.

The curriculum development and technical staff were predominantly (70%) males over 40 years old. All held either college diplomas or university degrees, three at the Masters level. Their average years of computer use was 12. The majority (63%) fell into the “keen to find new uses for my computer” category and 75% described themselves as very experienced. The three managers were all in their 40’s and on average had spent 14 years working with computers. They described themselves as being happy to work with computers and intermediate in degree of experience.

Virtually all of the staff reported that they used computers for word processing, database work and email. Many used spreadsheets and just over half performed desktop publishing. All used the Web for research but fewer than half engaged in bulletin board discussions, listservs or chat groups. In other words, there was limited familiarity with interactive online tools. Half of the staff interviewed had at some time taken an online, distance education course, but in some cases their experience was negative. For example, several had experienced non-functional Web links, poorly designed learning materials, overly large online classes, heavy workloads and feelings of alienation.

**Incentives and expectations**

One key incentive to change was the perceived value of WebCT™ for curriculum management. Learning managers welcomed greater consistency and quality control. Materiaik could be easily updated and were visible and therefore open to constructive critique. Learning managers recognized that the change would force them to be more disciplined and coordinated.

Learning managers looked for additional incentives including training in curriculum design and education theory. They asked for and received laptops and internet access that would allow them to work from home over the summer. One new instructor was brought on staff early to assist with the development. When individuals in management acknowledged the hard work of their staff, this appreciation was clearly an incentive.

The opportunity to explore new teaching tools was seen by some to be an inherent incentive. Others, however, were skeptical of their value.

In pre-project meetings, management pointed out how having clear learning targets accessible online could facilitate objective rating of student competencies. Bulletin boards having a permanent record could also provide data for assessments. However, learning managers rarely spoke of WebCT™ as a possible aid to assessment of students. On the contrary, some feared that use of the online platform might encourage more testing of knowledge and less assessment of demonstrated competence.

When considering the college’s motives for adopting an online platform, learning managers listed benefits to the institution (e.g., wider markets and ease of administration) and some identified benefits to students (greater access, consistent products). They did not perceive that the impetus for change involved benefits to themselves. So, there were efforts to evoke broad commitment that resulted in a general readiness to engage in the process, but some staff went into it with reservations concerning the possible impact of the new tools on the future quality of the college learning experience.
Pilot project: the team, the time line and the work plan

A Knowledge Management Unit (KMU) was established in 1998 to support the change to Web-based curricula, and the pilot project was conceived in December 1998. Meetings followed that involved staff at all levels, including the BIT coordinator, and a process plan was developed.

A project team was established that included the manager of KMU, a project manager, several curriculum development staff, publishing technicians, a programmer and several learning managers. None of the team had experience developing an online template for competency-based learning materials. In-house expertise in preparing curricula for distance delivery was limited. The team went to work in the spring of 1999 with the goal of having the BIT curriculum published on WebCT™ by September 1999.

Project process

The learning managers thought they could hand over their teaching materials and the project team would insert them into some template appropriate to their competency-based educational system. KMU staff expected the job to consist of publishing existing curricula in a template that the learning managers would help to develop.

In the rapidly-changing field of Information Technology, frequent updating of courses is required. The project team soon discovered that course materials were not all on computer files, and the existing files were not always current versions of learning activities. Then, in March 1999 industry advisors called for curriculum revisions that were more extensive than expected. The additional work was inserted into the work-plan while maintaining the original target of September 1999. The time requirements and complexity of the task were greatly underestimated.

Because learning managers decided they could not enter the process until their students had left in June 1999, there was little time to achieve consensus with the project team on pedagogical principles and expectations. In an effort to meet project deadlines the team began developing materials for publication while the learning managers were still teaching. When they brought their work in for the learning managers to see, the project team faced disagreements over how skills were grouped into learning activities, and over how the online template should be designed.

Most BIT learning managers were initially enthusiastic about the move to WebCT™. Without exception, their enthusiasm dissipated because expectations did not match reality. The project had an unrealistic schedule and the technical support was less than anticipated.

Work proceeded through the summer, with learning managers providing input during their vacations. It was a very stressful and frustrating experience for most participants. Following the college’s Instructional Systems Design procedure, subject matter experts drew on Internet and print resources and consulted with industry representatives and their teaching colleagues. Materials had to be suitable for distance delivery, suited to the differing student infrastructures at two campuses and to the varied teaching styles of the instructors.

By September 1999, most of the learning materials were published on WebCT™ and available to students but the majority of learning managers had still not experimented with the online teaching tools, nor had they participated in WebCT™ training workshops. In the months that followed, some never opened WebCT™ except to check or print out sections of the curriculum, nor did they encourage their students to embrace or explore the platform.

Throughout the academic year 1999-2000, the development team endeavored to complete and improve the online courses. A staff person with experience developing online learning materials was hired. With this injection of expertise, learning managers found that template design elements were reasonably justified. Also, there was help to ensure that learning activities were sufficiently detailed and flexible to be used by isolated distance learners. This intervention, together with the determination of everyone to succeed, allowed the project to reach a satisfactory conclusion.
The student view

During the 1999-2000 teaching year, few students logged on to WebCT™ except to download and print out the learning resources. As most instructors made no attempt to introduce and use the interactive tools (bulletin board, chat, white board, internal e-mail, calendar), WebCT™ became a curriculum repository. Several students logged on from home to keep up with the course when dealing with urgent family matters.

Results of the ladder survey showed that the students noted a significant improvement in the organization of course material in their second year, when they were using the revised, online curriculum (paired t-test, df = 13, p = 0.004). The teaching method was felt to be significantly more relevant to their future work (df = 13, p = 0.020) and they were able to use their time more efficiently (df = 13, p = 0.010). There were no differences in terms of interaction with the instructors and other students, nor any significant change in where or when they learned. When asked what they felt were the benefits of having an online curriculum, one student appreciated easy access to information on what and when deliverables were required. A second commented on the better explanations of the skills they were expected to acquire and then demonstrate. One liked the Internet access and one said access to the curriculum was improved and it was good to have the possibility of communication between campuses. Four said there was no advantage and the remainder provided no comments. Most (82%) of these students said they would like to take online courses in future.

Reflections on the process and initial outcomes

Although staff were enthusiastic about modern technologies, open to learning new skills and dedicated to delivering a high quality product to students, and even though there was constructive intervention from managers, the development process was very difficult. Upon reflection, learning managers identified peer support as a critical factor in getting the curriculum revised and published. Problems with project management, the lack of prior team experience in development of online and distance materials, and the uncertainties learning managers had regarding education theory were the main impediments to success. Key benefits that emerged included new skills in consensus building, collaboration and curriculum development. The curriculum was improved in terms of the level of detail and focus. Standardization was perceived as a major benefit for students, faculty and the institution. Learning managers also felt increased control over program quality. In interviews, they said that, with new collaborative mechanisms in place, they now felt free to focus further development efforts in their individual areas of specialization. The majority (84%) believed that the process of putting a curriculum online had contributed to their professional growth and 43% felt that the new platform would make their jobs more interesting or challenging.

With detailed information in a centralized repository and accessible to all, learning managers spent less time explaining details to students and photocopying materials. Several said they were more free to be conceptual or free-wheeling with lectures. Students gained more control over their learning and benefited from the improved access and flexibility. Learning managers felt that their role was evolving. Rather than being expert holders of knowledge, they increasingly facilitate access to a world of expert knowledge available on the Internet and in industry-authored training modules.

Subsequent to going online, teaching staff were reluctant to adopt the newly available teaching tools. Only one instructor experimented with the online chat and bulletin board. He considered that his interaction with students had been enriched because he no longer controlled the information, and because students could email or chat to him outside of class hours. Shy students and those prone to longer reflection were more vocal in an online setting. When interviewed in the summer of 2000 some other learning managers indicated their intention to use the bulletin board in the following semester.

However, some learning managers still worried that there could be pressure from the college to adopt online teaching strategies that would be inferior to traditional methods or would detract from the development of mentoring relationships. Several were dismayed at the limited budget available for new infrastructure to support audio and video resources. Finally, some limitations of WebCT™ remained unresolved.

It is the pedagogical concerns that are most likely to affect future development. Most learning managers were reluctant to promote any online activity that might reduce focus on development of interpersonal skills (team work, project management, conflict resolution, etc.). Faced with students who were spending more time working at home and less in the lab, several worried about how to detect a student in trouble, or speculated that there could be less interaction among the student cohort. Initial findings from student surveys showed that, when their
instructors did not employ the tools attached to the platform, students did not voluntarily explore or use them. However, in future years early adopters will continue to explore and promote new teaching technologies and the use of the platform will evolve, possibly in response to student demand for greater flexibility (Pajo & Wallace, 2001). On-going research will show to what extent the concerns of learning managers are realized.

Conclusions

Placing an entire program at the community college online was undertaken in a short period with limited support. It was the first time any of the participants had attempted such a project, and they learned valuable lessons. Some of these are common to any development project (Ellsworth, 2000), such as the need for a clear vision and leadership, careful marketing of the innovation, skilled project management, careful selection of team members, realistic time lines, incentives to participate, attention to training needs and effective communication. Clearly, it is not a good idea to select as a pilot project a very complex program that involves several campuses and many teachers delivering both face-to-face and distance courses. Also, trying to do curriculum revisions at the same time as the transfer to a new template and platform raises stress levels and sets the stage for disputes among faculty and staff. Further, it cannot be assumed that teachers in information technology will automatically embrace technological teaching tools.

A key lesson is that a project that goes beyond a change in mechanics and includes a challenge to existing teaching culture requires in-depth consultation, training and time for adoption and adjustment. In this case, college staff were eager to adopt an online platform that standardized the curriculum and facilitated its maintenance. However, insufficient time was allowed for project participants to decide how their new curriculum template could be designed to support their pedagogical approach. There was also concern that new teaching technologies might be unsuited to competency-based education. The promotion of online teaching tools to teaching staff committed to one-on-one, face-to-face contact with students was clearly a flashpoint for conflict because there had been no time for staff to experiment with the tools and become convinced of their value. Few had any prior, positive experience with online distance education.

In hindsight, it would have saved much time and stress if the focus had been clearly on WebCT™ as a curriculum management tool, and evolution of new teaching tools had been set aside as a longer term, participatory development project.

Out of these lessons came changes to the development process. Management recognized the need for additional expertise, and resolved to pursue future curriculum revisions separately from online migration. The next project will involve a program having well-developed curriculum and learning managers who have lobbied for change. Also, the learning managers will nominate a project manager from their own ranks. Infrastructure needs have been reviewed and a strategic development plan is in place.

To ease the cultural transition, processes will be developed through which staff can share their experiences with WebCT™ and curriculum development. A research program will provide on-going feedback of student response and learning manager adaptation to new teaching technologies. The Learning Managers’ Program has also been put online and the use of online interactive tools by all learners in that course (i.e., the incoming learning managers) will be required.

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