E-LEARNING BUSINESS CASE FOR YORK UNIVERSITY

Submitted to the Vice-President Academic & Provost

by the

e-Learning Working Group

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Executive Summary

The Provostial White Paper calls upon York to engage in a planned and coordinated effort to expand e-learning opportunities for students. E-learning is viewed in the paper as a way of improving student accessibility, engagement, and learning as well as part of a strategy for managing the enrolment pressures facing York. The Vice-President Academic & Provost charged the e-Learning Working Group with the task of developing the business case for e-learning at York. This report sets out the Working Group's recommendations for implementing an e-learning strategy at York that will meet the White Paper's goals.

A review of the research literature supports the White Paper's views on the benefits that may arise from e-learning. Generally speaking, both fully online and hybrid courses that blend face-to-face with online experiences have a distinct advantage in providing students with more flexibility in their personal schedules and making higher education more accessible. Evidence of this comes from the rapid increase in online enrolments in higher education over the past several years. In the U.S., according to a very recent study by the Sloan Consortium, more than one in four students now take at least one course online and online enrolments are growing 17 percent annually compared with an overall system enrolment increase of 1.2 percent. Comparable Canadian statistics are not available; however, Athabasca University, Canada's largest online university, has some 38,000 students enrolled in 776 courses (72,040 enrolments) in more than 90 undergraduate and graduate programs. In Ontario, Ryerson University appears to have the highest number of course enrolments (58,276) followed by Waterloo (21,311) and Guelph (over 20,000). York, a much larger institution than either of these three, last year had 9421 students enrolled in 123 fully online undergraduate courses and 2741 students in 18 blended courses.

Little published research is available on the costs of online or blended learning. This is appears to be because universities want to offer online courses for competitive reasons provided their costs are not unreasonable and they attract a sufficient number of students. What research there is suggests that e-learning can be cost-effective, although initial startup costs can be higher than traditional lectures and it may take several years for costs to average out. The University of Central Florida, a well-regarded pioneer in blended learning and similar to York in size and student demographics, reported recently that they saved $7 million in construction costs and over $277,000 in annual operating costs through implementation of blended and online courses.

Research on the student learning benefits accruing from online courses is much clearer. A study conducted over a decade ago by the Institute for Research on Learning Technologies of Atkinson College distance education courses found that online students achieved higher grades than their peers in the same courses offered in traditional lecture

format. Since then, research has consistently demonstrated that students in fully online courses achieve slightly higher than those in face-to-face classes; moreover, students in blended courses tend to outperform those in fully online courses.

In addition to reviewing the research literature on e-learning, the Working Group analyzed e-learning policy documents available online of key universities in Canada and selected international universities. Several trends became evident from the analysis. Most universities see the adoption of technology as a way to enhance the effectiveness of teaching and improve student learning outcomes; they see e-learning as a way to increase access and enrolments; they plan to increase support and professional development opportunities for academic staff to integrate technology effectively into teaching and learning; and they seek to grow the university's profile and reputation as a leader by taking up e-learning. Several Canadian universities stand out in their plans. For example, Carleton aims to be a national leader in distance and online learning, U of T wants to lead in developing and implementing e-learning technologies, and Waterloo is striving to become known as Canada's connected campus. Several American universities, such as Drexel and Purdue, set out specific targets and guidelines for achieving 10 percent of student undergraduate credit hours online. What this analysis highlights is that York lags other universities by not articulating an e-learning policy that will help the institution in planning and allocating resources in this area.

From the literature review and policy analysis, the Working Group concluded that there is a unique opportunity for York to expand significantly in its e-learning course offerings. The literature suggests that students can learn better in blended courses than in either fully online or face-to-face courses and, at the same time, blended courses can meet the White Paper's other goals of increasing student access and engagement. Additionally, no other Canadian institution has chosen a strategy to specialize in blended learning. Thus, York could grow to become a national leader and significant international player in blended learning—a path that the Group recommends. Such a strategy would not negate development of fully online courses as they should continue to be developed in key areas for strategic reasons; however, the Working Group advocates a strong and focused effort at growing the number of course and program offerings in the blended format.

For modeling purposes, the Working Group chose to estimate the revenue and costs associated with an ambitious plan to increase the number of online courses at the rate of 100 courses per year for five years with each course having an enrolment of 100 students. Although redesigning 500 courses would be a very significant undertaking, this would result in only approximately 12% of all York courses being offered in a partial or a fully online format in five years. If all of the enrolments in these courses came from new students, the University would realize additional revenue of approximately $6.2 million in the first year and $31.2 million by the fifth year. This revenue would come from the normal government grants and tuition, as well as from a modest Associated Course Fee

(ACF) for technology. Moreover, the blended model could allow the University to use any remaining existing excess classroom space more efficiently than the traditional lecture model and sizeable cost avoidance is possible when it becomes necessary for new classrooms to be built.

There are two major costs associated with the proposed initiative. One is the cost of technical support during development, ongoing technical support, and the technological infrastructure. During the first year, these costs would amount to just over $1.3 million and would rise to $2.1 million at the end of the fifth year. Important to note, however, is that these costs could begin to be recouped by the third year and fully recouped by the fifth year with an ACF of $60 per student per course. The other major cost is for faculty training and course development. Although substantial (approximately $687, 500 in year one), this is an area that the Working Group feels York has chronically underfunded and that investment is required. Possible funding sources for this cost include revenue from program growth, one-time-only grants that could become available from the province, and external donations and industry partnerships.

The Working Group concludes that even though the initiative outlined in the report is ambitious, it is essential if York wishes to become a significant player in the e-learning field in Ontario. A more modest first step could be taken instead of attempting to restructure 100 courses in the first year. The University could embark on a pilot to restructure 25 to 50 courses by September 2011 and assess the costs and experiences to aid in the planning of future expansion. If this scaled-back plan is adopted, the University should realize that it runs the risk of falling further behind other Ontario institutions in its e-learning course offerings.

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I. Introduction

This report was initiated by the Academic Vice-President & Provost with the goal of building the case for implementing the recommendations of the Provostial White Paper that deals with teaching and learning with technology at York. A working group, comprised of academic and staff leaders in teaching and learning with technology and chaired by Dr. Ron Owston, Director of the Institute for Research on Learning Technologies, met bi-weekly between April and June 2010 to prepare this report. Assisting the group was Sarah Cantrell, Director Integrated Resource Planning, as well as two graduate student researchers.

The report begins with a definition of the scope of the project and a summary review of literature on technology-enhanced learning. The literature review covers research related to student access and learning afforded by the web and the costs associated with online learning. After this, policies with respect to teaching and learning with technology at other universities in Canada and internationally are reviewed. An e-learning framework based on the literature is next presented with a recommendation that York consider focusing on a blended or hybrid approach to instruction. This approach offers more advantages than fully online in terms of addressing the concerns in the White Paper although, at the same time, the committee recognizes that there may be a need to offer fully online courses for strategic reasons. Following the discussion of the framework, a model to support significant growth in e-learning at York is described and estimated costs and revenue associated with the model are provided. The report concludes with recommendations on how the proposed e-learning initiative could be implemented.

II. Scope of Project

Focus

The focus of this case is to propose strategies for York to enhance student accessibility, increase engagement, and improve the quality of learning through the use of technology and, at the same time, expand its online and blended academic course offerings in response to enrolment pressures.

Definition of terms

E-learning: we will take this term to mean the electronic delivery of instruction mainly—but not exclusively—via the computers and the Internet/Web. Other electronic forms of delivery may include learning from CDs and DVDs on computers and from downloaded audio or video files on a handheld device such as a smart phone or iPod.

Blended learning: will refer to courses where a required component of the course is delivered online and the face-to-face time with instructor and students is reduced accordingly. Typically, a course is considered to be blended if the online component varies between 30% and 80% of the total course time. The term hybrid learning is sometimes used to describe courses of this type.

Online learning: this term is used to refer to courses where 100% of the instruction is delivered via the Internet.

Web-enhanced learning: this term will be used to describe courses where learning is supplemented by web materials, resources, or activities. The normal face-to-face instruction time remains the same in these courses despite the addition of a web component.

Rationale

As one of its 11 priority benchmarks, the Provostial White Paper calls for York to "improve accessibility for students by significantly expanding online delivery of courses and programs as part of its efforts to enhance learning through the use of technology" (White Paper Companion, p. 14). Thus the paper sets up a two-part goal for York, one specific and one more general. The specific goal is to significantly expand online delivery; later the paper says that this may be accomplished either through fully online or blended courses. The paper urges that the expansion of online delivery be "planned, deliberate, coordinated institutional manner" (Companion, p. 41), so that rather than simply responding to isolated faculty interests, efforts should be made to identify strategic programs where there will likely be significant demand for online offerings. The rationale offered for the online expansion is largely to make learning more accessible to York's large body of commuting student and respond to the needs of part-time mature working students. Online delivery is also seen as a way to respond to enrolment pressures without having to build more physical classroom space. The more general part of the goal calls for York to step up its efforts to enhance the teaching and learning environment through technology. While accessibility is still part of the rationale for this, the paper also discusses the potential for technology to improve student engagement and learning and respond to the changing expectations of today's net savvy generation of students.

The White Paper additionally notes that York has made "modest progress towards systematically incorporating new technologies in the learning process, particularly as compared to our competitors" (Overview, p. 13) and enjoins York to ameliorate the situation and take a leadership role in the use of technology in teaching and learning.

Therefore, this report will provide the case for how York can significantly increase online and blended course enrolments in ways that will lead to improved student accessibility, engagement, and learning.

III. Review of Blended and Online Learning Research Literature

When educators began experimenting with the web in the mid-1990s, Owston (1997) argued, in one of the first widely-cited academic articles about the use of the web for teaching and learning in higher education, that its use can be justified if three questions can be answered satisfactorily. First, can it increase access to learning? Second, can it lead to improved learning? Third, can its use result in lower costs or at least not increase the costs for learning? These criteria continue to be used today to provide the rationale for online and blended learning in higher education (e.g., Graham, 2006) and can inform the case for increasing the enrolment in online and blended learning at York.

Access to Learning

There is no question that the web has opened the door to higher education to students who choose not to or are unable to attend traditional face-to-face classes due to work, finances, distance, or other barriers. According to the most recent statistics in the U.S. from the Sloan Consortium (Allen & Seaman, 2010), over 4.6 million students were taking at least one online course during the fall 2008 term, which represents a 17 percent increase over the number reported the previous year. Moreover, the 17 percent growth rate for online enrolments far exceeds the 1.2 percent growth of the overall higher education student population in that country. More than one in four American higher education students now take at least one course online according to this report.

Comprehensive online enrolment statistics for Canada are not readily available. Statistics Canada reported that approximately 1.5 million adults 18 years and older used the Internet in 2005 for "distance education, self-directed learning, or correspondence courses." (http://www41.statcan.gc.ca/2008/1821/ceb1821_002-eng.htm). The Canadian Virtual University (CVU), an association of nine Canadian universities specializing in online and distance education, lists over 300 degrees, diplomas, and certificates and 2,000 courses offered by its members via "online and distance education." Athabasca University, the largest member of CVU has some 38,000 students enrolled in 776 courses (72,040 enrolments) in more than 90 undergraduate and graduate programs.

We researched online enrolments at other universities in Ontario as well as Athabasca, Simon Fraser, and Concordia by searching university websites for reports. These data are presented in Appendix A. Most Ontario institutions had enrolment reports online with the exception of University of Toronto and McMaster.[1] Our data show that all are offering online courses. Ryerson appears to have the highest number of enrolments (58,276) in

[1] We made telephone calls to the registrars of these two institutions; however, they stated that their institutions did not offer online credit courses. Informal reports from others contradicted this but the number of courses they offer is indeterminate.

Ontario followed by Waterloo (21,311) and Guelph (over 20,000). Moreover, the institutions appeared to offer considerable breadth across program areas.

In 2009-10, York had 9421 students enrolled in 123 online undergraduate courses in Internet courses (ITNR course code with the vast majority concentrated in LA&PS) and 2741 students in 18 blended courses (LECI code). These courses represent 3.6% of the total number of courses offered by the University (3933) and 4.9% of the enrolments (245,594). In addition, an undetermined but probably relatively small number of York faculty are teaching courses in blended format that are not identified by a unique code.

By way of comparison, Simon Fraser, and institution similar to York in many aspects, has slightly more online enrolments (10,812) than York; however, Concordia, which is also similar to York, has over 25,000 enrolments. A third university, Carleton, to which York is sometimes compared, has a similar number of enrolments as York (9,058), although our research revealed that these courses are delivered via television. These data suggest that York, while not the smallest provider of online courses, trails most other institutions in Ontario, and does not have a strong national presence in online education.

Costs of the online/blended courses

There is a growing sense among universities that they want to offer online or blended courses for competitive reasons provided their costs are not unreasonable and that they attract a sufficient number of students. Thus, little effort seems to have been put into carrying out and publishing research that compares costs of online or blended learning to traditional to face-to-face classes. The research that is available has not yielded very conclusive results largely because of the complexity in gathering costing data and because of decisions researchers make in determining which cost factors they include. Nevertheless, this research can provide some guidance on what York may expect about the cost of expanding online enrolments.

One of the most cited studies on costs is the Pew Charitable Trust Foundation sponsored Program in Course Redesign (Twigg, 2003). This study examined the outcomes of 30 colleges and universities that received funding to restructure their courses using technology in a variety of ways. The restructuring ranged from using technology to supplement lectures with some out-of-class technology activity through to making courses fully online. Research showed that per student cost savings averaged 41% when comparing the traditional format of the course to the redesigned format incorporating technology. Institutions in the project realized cost savings by freeing up faculty to teach other courses, eliminating adjunct faculty, serving more students with the course, and/or decreasing faculty workload for the course. Important to note was that the project only compared costs before and after redesign and the study did not include development costs, nor infrastructure and equipment costs as the latter were already in place. As a result of this study, Twigg (2003) argues that the most cost effective approach in higher

education is to put online the dozen or two large undergraduate courses that typically make up about one percent of an institution's enrolment.

Another study carried out at University of California at Davis compared face-to-face to blended versions of 10 courses with enrolments from 200 to 500 students (Bachman, 2004). The blended courses had all lectures online but students met face-to-face with teaching assistants for discussions. Not unexpected, initial costs were higher for the blended sections because of technical infrastructure and content development; however, over 5 years costs averaged out to be approximately the same for the blended and face-to-face versions. This study included the cost of building space and interest amortized over 30 years.

On the other hand, Hartman (2007) reports that the University of Central Florida, a well-regarded pioneer in blended learning and similar to York in size and student demographics, saved $7 million in construction costs and over $277,000 in annual operating costs through implementation of blended courses, although he does caution that cost savings will not be realized if technology is just added onto existing courses without pedagogical change. Including tuition and state support, the university's online and blended courses generate nearly $37 million in revenue annually and produce about at 10:1 return on investment. Hartman cautions that even though classroom space can be freed up through blended learning since students meet face-to-face less often, only 50% to 67% of the unused space is recouped for other courses because of timetabling difficulties.

While generalizations from the above research are difficult, it nonetheless illustrates that online and blended learning can at least contain costs and possibly reduce costs compared to face-to-face delivery, depending upon what cost assumptions are made and the instructional model employed.

Learning in blended and fully online courses

Although online and blended courses are offered by many leading universities around the world, the quality of the student learning experience in these courses, particularly fully online ones, is often questioned. Over 10 years ago Ron Owston led a study at York University that compared final grades of students enrolled in all Atkinson College courses that were offered in three formats: (1) face-to-face lectures; (2) traditional correspondence courses that used mail, telephone, and print materials; and (3) fully online courses. The findings were quite surprising. Students in online courses (N= 1099) and face-to-face courses (N=2467) scored significantly higher than their counterparts in correspondence courses (N=2318) ($p<.001$ and $p<.01$ respectively), although no significant difference was found between Internet and in-class students. The data were re-analyzed by comparing only students with passing grades because according to the registrar's office, students rarely failed a course, they just did not complete the final exam

and got an F grade. When this was done, the online students achieved significantly higher than their face-to-face counterparts ($p<.001$), who in turn scored significantly higher grades than correspondence students ($p<.001$). Dropout rates were slightly higher for online courses (11%) compared to face-to-face and correspondence (both 8%). Students also reported that taking an Internet course was generally a very satisfying experience, with 73 percent saying they would recommend the course to their friends and 68 percent feeling that the course stimulated their interest in taking further courses in the discipline. (See Wideman & Owston, 1999, for details.)

In another large scale study, Robert Bernard and colleagues at Concordia University carried out an exhaustive meta-analysis of 232 studies on distance education (DE) between 1985 and 2002 to compare the effectiveness of DE and classroom instruction on student achievement as well as other variables (Bernard et al., 2004). There was a wide range of technologies and media used in the DE studies they examined, although many of them included the Web, discussion groups, and/or email. The authors concluded that there is a very small yet statistically significant effect favoring DE conditions on overall achievement outcomes; however the variability across studies was wide and significant. More recently, a meta-analysis of empirical studies comparing learning in face-to-face and online courses found that "students who took all or part [e.g., blended] of their class online performed better, on average, than those taking the same course through traditional face-to-face instruction" (U.S. Department of Education, 2009, p. xiv).

Similar results slightly favouring online courses were reported by Twigg (2003) in the Pew course redesign project mentioned above. She reported that student learning improved in 20 of the 30 courses she studied compared to the former versions of the courses, while the rest showed no significant difference.

The University of Central Florida's extensive experience with blended learning suggests that on average, blended courses have higher success rates and lower withdrawal rates than their comparable face-to-face courses and fully online courses (Dziuban, Hartman, Juge, Moskal, & Sorg, 2006). Additionally, the majority of faculty teaching in those courses at UCF indicated that more and higher quality interaction occurred in their blended courses than in their comparable face-to-face sections. Owston, Garrison, and Cook (2006) reported in case studies of blended learning carried out at 8 Canadian universities, including York, students liked that blended learning provides scheduling flexibility and varied learning opportunities, while maintaining traditional classroom experiences such as in-class discussion. Both faculty and students in the study felt that the online component of blended learning encouraged the development of critical thinking skills, and faculty found that they got to know their students better as individuals in blended courses than they would have in traditional lectures. Moreover, Owston et al. (2006) and Twigg (2003) found high levels of student satisfaction with their blended course experiences.

Thus, research suggests that students can achieve as well in fully online and possibly higher in blended courses than their counterparts in face-to-face courses. Moreover, student satisfaction is generally high in online and blended courses. The one area where fully online courses seem to show weakness is that dropout rates tend to be higher in fully online courses as they typically require more motivation and self-discipline to succeed. Therefore, fully online courses could be problematic for first year students entering university directly from high school as they may not have matured sufficiently to cope with the independent study required of this kind of course.

Learning in web-enhanced courses

Over the past decade or so many faculty have experimented with supplementing their courses with web-based technologies. These efforts include: making available course materials, readings, PowerPoint slides, or web links on a course website or within a course managements system such as Moodle, Blackboard or WebCT; adding online discussions to supplement in-class discussions; using wikis for students to collaborate online; and making available audio or video recordings of lectures for students to download and review. A review of the published outcomes of these kinds of initiatives is beyond the scope of this report. Generally speaking, these initiatives cannot be expected to increase overall student achievement significantly as compared to courses where these innovations are not used; their advantages are more qualitative. Typically they serve to increase students' motivation, satisfaction, and engagement in their courses, provide access to course content when they miss lectures, give students an opportunity to interact with the instructor and their peers beyond the walls of the classroom, and review content before exams.

Conclusions

Online and blended courses have a distinct advantage in providing students with more flexibility in their personal schedules and making higher education more accessible. Depending on what cost factors one chooses to examine, online and blended courses are comparable or slightly more cost effective that traditional lectures. Moreover, students do not appear to suffer in grades when studying online and, in fact, they may achieve slightly higher and may be very satisfied with their learning experience. Web-enhanced courses bring more qualitative improvements to the learning environment. Therefore, there appears to be little downside for York University to proceed with a major expansion in online and blended course offerings and to introduce more web enhancements to existing courses. Being somewhat of a latecomer in developing strategic plans in this direction, York can also benefit from an increasing body of research on designing effective online courses, learn from the experiences of other institutions, and take advantage of more reliable technology than what was available only several years ago.

IV. e-Learning Policies and Plans of Other Universities

A year ago Ron Owston and doctoral student Denys Lupshenyuk began to construct a website that contains links to higher education e-learning policy documents, teaching and learning support centers, and technology innovations. This website, FutureCampus.org, served as a valuable resource to the working group to find out what other universities are doing with respect to e-learning. They undertook an analysis of the e-learning planning documents and faculty support models of York's direct competitors as well as those of other innovative and/or leading universities worldwide. A list of these universities is given in Appendix A. Below is an overview of their findings. Note that not all universities make their planning or policy documents available on the web, so this analysis is based only upon publicly accessible documents that we were able to locate.

From an analysis of university websites, we found that almost all Canadian universities have pan-university academic strategic plans and information technology strategic plans, however only a few have a separate plan for e-learning (e.g., Concordia, University of Alberta). Institutions in the U.S. and the rest of the English-speaking world have the same tendency with the exception of some universities in the UK, Australia, and New Zealand (e.g., Durham University, Oxford Brookes, Swansea University, University of Kent, University of Wales Aberystwyth, University of Auckland, University of Sydney, University of Queensland, and University of Wollongong). In these policy documents, the universities state their intention to develop a university-wide e-learning initiative and to establish a strong, coordinated, and sustainable infrastructure to support the development and delivery of blended and online instruction (e.g., Concordia, SFU).

The analysis of e-learning policies/strategic plans revealed the following goals with respect to teaching and learning with technology to be representative:

Increase adoption of technology to enhance the effectiveness of teaching and improve student learning outcomes. Most Canadian universities (e.g., Carleton, Concordia, McGill, McMaster, Queen's, SFU, U of Alberta, UBC, Guelph, U of T, Waterloo, Western, Windsor) in their strategic plans strive to position themselves as a learner-centered institution offering a technology-enhanced academic environment that promotes inquiry, collaboration, and innovation and facilitates the exploration and adoption of leading-edge learning technologies which will prepare students to be tomorrow's leaders. A number of university policies (e.g., Brown, CSU Chico, Drexel, Duke, Indiana, McMaster, Monash, Oxford Brookes, Seton Hall, U of Adelaide, UC Berkeley, Western) suggest that the use of technology needs to be embedded into curriculum in a pedagogically thoughtful way and applied to maximize teaching and learning opportunities on and off the campus (e.g., smart classrooms, flexible delivery, media-rich environment, mobile computing, highly personalized and socially mediated learning environments).

Bowling Green State University, Georgia State, Guelph, and Windsor suggest reviewing technology needs across departments, academic disciplines, and faculty needs in order to develop a framework for matching technology with curriculum as well as to plan for faculty development initiatives. University of Auckland, along with UC Berkeley, observes the demand for integration of Web 2.0 technologies into the delivery of university education, in particular, into a learning management system (LMS) infrastructure. With Web 2.0 the institution is committed to connect university-based digital services and personal Web 2.0 spaces of students and faculty and, ultimately, make the university an active part of their digital life.

Increase access and enrolments through different modes of instruction, including online and blended courses and/or programs. Some Canadian universities, such as Carleton, Concordia, Guelph, SFU, and U of Alberta, set their goal to increase access and enrolments through well-developed e-learning programs delivered to students with various educational and training needs (e.g., students who are geographically dispersed, students being unable to attend on-campus programs, and full-time students seeking a flexible option to extend their learning opportunities). In this regard, the universities intend to keep the focus on instructional design and appropriate pedagogical strategies to engage students through the use of technology and foster academic success at a distance rather than on simply improving IT access to educational resources.

A number of U.S. universities, such as Bowling Green State, Drexel, Purdue, and Seton Hall, map out in their policies a plan for expanding their online offerings, in some instances, for the purpose of increasing the flexibility of class scheduling. Their plans offer clear and detailed guidelines, such as identifying prospective online students, selecting programs/courses and faculty qualified to teach online, setting a five-year goal of offering 10 percent of undergraduate credit hours in an online mode, developing assessment procedures for online learning, encouraging each academic department regularly review their online courses to meet the needs of the changing audience of online students.

Increase support and professional development opportunities for instructors and academic staff to effectively integrate technology into teaching and learning. There are three key strategies that universities intend to follow to facilitate the achievement of excellence in teaching through the use of technology. The first one focuses on the investment in faculties, facilities, and infrastructure to support the integration of innovative technology into teaching and learning by eliminating the duplication of technology and instructional support services and by reducing multiple access points for faculty members to obtain support they need (e.g., Carleton, Guelph, Oxford Brookes, Ryerson, SFU , U of Alberta, Waterloo, Western). The second strategy outlines the necessity of providing faculty and academic staff with efficient support and professional development opportunities in (a) designing/re-designing e-learning courses; (b)

producing high quality open and reusable learning objects/resources; and (c) improving e-learning competencies and technology skills (e.g., Carleton, Concordia, Drexel, Guelph, King Khalid, McMaster, Oxford Brookes, Seton Hall, SFU, U of Alberta, UC Berkeley, UNSW, Waterloo, Western, and Windsor). And, the third strategy is to stimulate and remunerate faculty, academic staff, and TAs for enabling the utilization of technology and developing innovative teaching strategies and learning resources (e.g., Concordia, Oxford Brookes, Ryerson, Seton Hall, SFU, U of Alberta, Waterloo, and Windsor).

To better manage the gaps and overlaps in e-learning support services, many universities (Brown, Concordia, Georgia State University, Ryerson, University of Kent) propose to blur organizational boundaries and create a single source of support for faculty (e.g., an e-learning unit, or committee, or academic portal). According to their policies, this kind of unit needs to be interlinked with campus information services to ensure the provision of both core and peripheral technologies (e.g., web-based applications like Turnitin, classroom technologies, and other hardware and software). Some universities discuss the possibility of either having a position of Faculty Learning Technologist in each academic unit (e.g., University of Kent, Oxford Brookes) or having a support team (e.g., Brown) to work with individual faculty on the integration of technology into the curriculum. A similar approach to faculty support is enunciated by Indiana University, Oxford Brookes, UC Berkeley, and UNSW. They advocate for leveraging relationships with university centers for teaching and learning on all campuses to support e-learning and encourage collaboration between faculty members and instructional designers. Importantly, some policies (e.g., University of Wales Aberystwyth) state clearly that a decision about engagement with e-learning stands behind the faculty's professional judgement, informed by a robust educational research and predicated on evaluation of technology capabilities as to whether they are able to support the demand for e-learning.

In terms of providing professional development opportunities for faculty, some universities (e.g., Brown, Durham, McMaster, Oxford Brookes, Seton Hall, Swansea, U of Kent, and U of Wollongong) recommend establishing online communities of practice, for instance, virtual resource centers, peer consulting networks, or teaching spaces for e-learning practitioners, for discussion, support, and sharing best e-learning practice. Indiana University speaks in favour of having a permanent university presence in virtual world environments to allow faculty experimenting in the use of such environments.

Improve learning spaces for on- and off-campus students. A large number of universities (McMaster, Ryerson, U of Alberta, UBC, and Windsor) maintain their focus on improving the quality of learning spaces and connecting on- and off- campus students and instructors for academic, as well as for extra-curricular activities. Some universities (e.g., McMaster, U of Alberta, and Windsor) suggest providing training for students on learning technologies so that students are able to make informed decisions about

participating in various e-learning programs. Indiana University proposed the development of informal learning spaces equipped with rich media capabilities in order to extend student learning outside the classroom (e.g., spaces for collaborative work on rich media projects). As most universities (e.g., University of Kent, CSU Chico, Georgia State, University of Sydney) implement a unified learning management system (e.g., Moodle, Blackboard, Angel), their policies ensure that students are made aware of the support (e.g., e-learning helpdesk) available to them for using such a system and how their courses make use of the system. In this regard, they recommend providing institutional LMS training for students, particularly during their first year at university, to cover all tools, study skills, and e-learning techniques and strategies. Some universities (e.g., University of Wales Aberystwyth) suggest offering students an attractive portfolio of taught courses that will supply students with a wide range of choices for their learning.

Assure the quality and standards of e-learning processes. Many universities in their policies reinforce the development of a quality assurance mechanism for designing and evaluating e-learning initiatives (e.g., Concordia, Oxford Brookes, U of Alberta, UBC, Seton Hall, Swansea, U of Kent, U of Wollongong) and, ultimately, fully integrate this mechanism into mainstream quality assurance procedures at both the institutional and departmental levels (e.g., University of Wales Aberystwyth, U of Wollongong). For instance, they offer such strategies as the development of a performance review framework for e-learning, monitoring and evaluation of e-learning programs in departments, collection and analysis of student feedback on their e-learning experiences, and comparison of university-wide current data on the use of e-learning with national benchmarks.

Foster connection between research and e-learning practice. Such universities, as McMaster, SFU, U of Alberta, and Guelph, advocate for developing a strong connection between research and practice in the field of e-learning. To accomplish the goal, SFU, for example, is committed to encouraging faculty to carry out research on e-learning and to contribute to the development of e-learning instructional methods and innovative learning resources. In some instances, universities want to carry out evaluation research of e-learning practice to better understand the effectiveness of e-learning and experiences of faculty and student, and to review periodically the impact of innovative technologies on access and retention, institutional infrastructure and processes, and e-learning policy development (e.g., Oxford Brookes, UC Berkeley, UNSW, Swansea).

Grow the university's profile and reputation as a leader in offering e-learning options. Although every university in Canada strives for excellence in teaching and learning in technology-supported environments, a few universities set a goal to become e-learning leaders. For instance, Carleton aims to develop into a national leader in distance and online learning, U of T wants to become a leader in developing and implementing e-

learning technologies, and Waterloo is striving to be known as Canada's connected campus.

Conclusions

The above analysis shows that there is a crowded field of universities offering online courses and striving to be leaders in e-learning. Thus there does not appear to be any rationale for York to become merely one more entry into this competitive field unless the university can distinguish itself or for pragmatic reasons simply desires to hold onto its market share. One area where we see an opportunity for York to excel is in blended learning. Although most Canadian universities do offer some courses in the blended format, none stand out as preeminent leaders in the way that the University of Central Florida does in the U.S. Furthermore, none in Canada appear to be setting a goal of appreciably increasing blended learning enrolments. Therefore, a significant opportunity exists for York to become the Canadian leader and recognized internationally for blended learning. By offering blended courses York can address its goals of enrolling more students without requiring costly new buildings, provide students with more flexibility in their schedules, and, most importantly, create learning experiences for students that can possibly be richer than traditional face-to-face lectures.

Blended learning is not the only way that York can distinguish itself in e-learning. There are many possibilities for designing unique fully online courses that could set York apart. For example, fully online courses can be designed to encourage more active student learning than is the norm in most online courses, to be inquiry oriented, and/or to promote student work in collaborative problems solving teams working on socially relevant issues. Another way for York to stand out is to continually experiment with innovative leading-edge technologies such as virtual worlds, e-books, smart phones, social networks, and high definition 3D videoconferencing. Regardless of the specific way York innovates, the university should carry out research on the impact of course designs and technologies on student learning as one further way to distinguish itself and at the same time improve instructional practice.

V. Potential Models – an e-Learning Framework for York

Three Delivery Models

There are three models that York University could adopt to deliver technology-enhanced courses: fully online, blended, and web-enhancement face-to-face. Table 1 below provides a framework for ranking the strengths of each model in meeting the four e-learning objectives – increase York's ability to respond to enrolment pressures, provide better experience for our commuter students, better engage students, improve student learning – identified by the Provost at a previous meeting and listed in the Provostial White Paper. The delivery framework has been colour-coded for ease of use indicating what the literature shows, on average, are the strengths for that model of delivery,

controlling for (or averaging out) all differences due to individual instructors, and other contextual factors. The colours are a ranking of the advantages of each delivery model for achieving each of the four e-learning objectives:

- Green: delivery model with most advantages for the Provostial e-learning objectives.
- Yellow: delivery model with intermediate advantages.
- Red: delivery model with fewest advantages.

Important to realize that red is not necessarily"bad" – it simply means that the corresponding delivery model offers the fewest advantages, on average, relative to the other two models for meeting a specific e-learning objective. Individual courses may vary from the overview in the table. For example, an individual course, depending on how it is developed, delivered, and who the instructor is, may excel at engaging students or promoting deep learning using any of the models in the table. Note that the blended delivery mode, by varying the proportions of online and face-to-face components, can operate anywhere in the continuum between fully online and fully face-to-face. The table, however, is based on the common definition in the e-learning literature that blended courses must involve some reduction of face-to-face time, varying between 30% and 80%.

TABLE 1 : E-LEARNING DELIVERY MODELS

E-LEARNING OBJECTIVES	FULLY ON-LINE	BLENDED On-line replaces 30% – 80% of face-to-face time	TRADITIONAL FACE-TO-FACE WITH WEB ENHANCEMENT
Increase York's ability to respond to enrolment pressures	• Maximum scalability — no physical space constraints • Development costs for new online half-course = stipend + technical support + 1-time training • Ongoing instructor/student/technology support costs for online half-course.	• Enhanced scalability — more intensive use of existing physical space • Development costs for new blended half-course = stipend + technical support + 1-time training • Ongoing instructor/student/technology support costs for blended half-course.	• Minimum scalablity — growth requires new physical space • Development costs limited to ongoing instructor/student/technology support for web enhancement needed.
Provide better experience for our commuter students	• No commuting time: (savings = 1.25 hours per course session per meet) and expenses (savings = $11.25 per course session per meet) • Maximum time flexibility for off-campus work and activities • No in-person connection to York community	• Reduced commuting time and expenses. Saving dependent on the proportion of face-to-face interactions. • Enhanced time flexibility for off-campus work and activities • Regular, in-person connection to York community; face-to-face interaction enhances online community participation	• Maximum commuting time and expense • Minimum time flexibility for off-campus work and activities • Maximum in-person connection to York community, but students want to minimize on-campus time
Better engage students	• No in-person connections to other students in classes • No personal connection to York community • Engagement limited to online interactions	• Best of both worlds — in-person connections to other students in classes and on-line interactions • Some in-person connection to York community • Students prefer blended model with "moderate" use of technology	• Maximum in-person connections to other students in classes • Minimum on-line engagement with other students and York community • Maximum in-person connection to York community, but students want to minimize on-campus time
Improve student learning	• Blended learning outcomes better than either fully online or traditional face-to-face • Limited flexibility to accommodate student learning styles • Success requires maturity and time-management discipline	• Blended learning outcomes better than either fully online or traditional face-to-face • Multiple formats accommodates widest variety of student learning styles	• Blended learning outcomes better than either fully online or traditional face-to-face • Limited flexibility to accommodate student learning styles • Advantages for students lacking maturity, time-management discipline

Legend: Advantages in meeting e-learning objectives — Most — Middling — Fewest

From Table 1, the following conclusions may be drawn:

- In terms of **increasing York's ability to respond to enrolment pressures**, the fully online course delivery model is most advantageous because of its scalability and because no additional physical space is needed to deliver courses. The blended delivery model is the next best as it also reduces (though to a lesser extent than the fully online model) the amount of time students need to spend in the classrooms, thereby, decreasing the dependency of enrolment growth on additional physical space. This reduction in the amount of physical space for the fully online and blended delivery models come at a cost – a significant initial investment is needed to develop the online components of the courses. The course material, associated learning objects, online framework, and technology used to deliver the courses need to be developed in advance well before the scheduled offering of the courses. Course developers, faculty, and teaching staff will also require training on online course development and delivery. This cost is in addition to the technical assistance needed for the development of online features of the courses. There is also an additional support cost component for updating and maintaining the online components of these courses.

- In terms of providing a **better experience to our commuter students**, the blended delivery model provides considerable savings in traveling for our commuter students. The fully online model is rated the second best because of the lack of any physical experience at the York campus. Based on the commuting cost model in Appendix A, the average net savings *per course meeting* for online delivery in place of face-to-face is about $11.25 in transit cost and about 1.25 hours in transit time. The total savings in the blended model depends on the extent of the reduction in face-to-face course meetings. See Appendix A for the calculations used to derive these numbers.

- In terms of **better engagement of students**, the blended delivery model is rated as the best as it employs the best characteristics of interactive online education with the interactivity that typically characterizes face-to-face classroom instruction. The traditional face-to-face is the second best followed by the fully online model, which limits the student-instructor and student-student interactions to computer mediated communication.

- Finally, in terms of **improving student learning**, the blended delivery model is again rated as the best as it allows students to create a personalized learning environment based on their learning styles. It exposes them to different point of views through online discussion groups, lets them express and explore their own views without any reservations that they may experience in a class environment. The blended delivery

model also fosters collaboration in the initial face-to-face meeting, which continues throughout the rest of the course in the online environment.

Recommendation for Blended Learning Model

Based on the forgoing comparative analysis of delivery models, *we recommend that the blended model be the focus of any substantive effort to develop an e-learning strategy and supporting capabilities at York* with the caveat that departments/program/instructors will have the final say in determining optimal delivery modes based on pedagogical or other arguments.

VI. E-Learning Support

Current Support at York

A significant increase in e-learning course offerings necessarily requires a concomitant increase in support services for development and ongoing maintenance. Currently, support for e-learning at York is available from a variety of sources, for example:

- The Centre for Support of Teaching (CST) provides advice on e-learning and pedagogy, information on course design, and a locus for information exchange amongst faculty;
- Some Faculties have internal capability (e.g., Education, Osgoode, Schulich) for course creation and faculty and student support;
- UIT Learning Technology Services (LTS) provides a variety of services from basic "Moodle" (learning management system support) training and technical support, course creation and support, and media services to faculty from across York;
- LA&PS eServices Office (eSO) provides e-learning support to its faculty in partnership with UIT; and,
- UIT Instructional Technology Centre (ITC) provides additional media and recording services.

A consistent and persistent complaint from many faculty has been that though these types of resources and supports exist, it is not clear how they can get support and whether an appropriate level of support will be available when they need it. The ambitions of the White Paper to grow and institutionalize the use of e-learning would demand a very different approach to planning and supporting e-learning.

Need for a New Support Model

Clearly, the current support model will not suffice and a new scalable model is required. This model would aim to:

- Enhance students' learning by promoting active engagement with educational tools and resources, peers, and faculty;
- Support growth to a state where at least 1 in 10 course offerings or about 400 courses are delivered in a blended mode;
- Continue to provide a set of online courses and programs to provide a presence in the market in niche areas (either by term or by discipline);
- Make it possible for every course to be "web enhanced"; and,
- Be flexible to grow (or shrink) the numbers and disciplines of e-learning courses.

The anticipated future represents a very marked change from our current state whereby:

- Relatively few blended courses are offered and, except for some small pockets of expertise, we have very little institutional experience in developing and delivering blended courses;
- The number of e-learning courses over the past several years has remained quite static, and the current course development and support model is largely occupied with "web-enhanced" courses and supporting ongoing work (vs. aggressively developing new courses); and,
- Most of the existing work in e-learning course delivery has been in LA&PS – the new model would need to have courses across all Faculties being developed/delivered.

The proposed growth would require a larger and more robust development and support model. The model must provide multiple and clear "pathways" to both extensive blended learning and the potential for growth to fully online courses (for additional full degree programs).

Proposed Support Model

Based on the above analysis, the five stage model illustrated in Figure 1 is proposed for creating and supporting blended and fully online courses at York. The model is based on successful practice at the University of Central Florida and is designed for quality enhancement. Assessment (evaluation) data are collected and fed back to guide continuing improvement of courses and instruction. The model assumes an integrated continuum from web-enhanced, to blended, to full online delivery where each successive approach builds on the previous one: "traditional" courses become "web-enhanced" and faculty learn to teach effectively in that fashion in a planned way. Blended courses then are developed from "mature" web-enhanced courses and so on, a practice that has proven very successful at UCF.

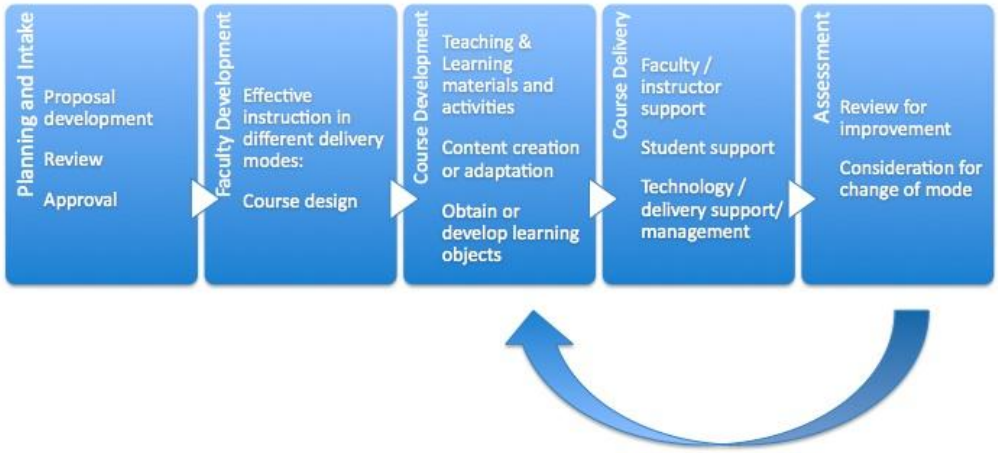

Figure 1 – e-Learning Support Model

Next the five stages of this model – planning and intake, faculty development, course development, course delivery, and assessment – are described.

STAGE 1: PLANNING AND INTAKE

The model calls for a formal "intake process" for the development of blended and online courses. This represents a departure from the current practice at York where a move to a different delivery mode is (generally) based on the individual interest and desire of faculty members. It is conceivable that some web-enhanced courses, if they require a significant investment of institutional resources to develop and support, would also be subject to the formal intake process. Also assumed is that the vast majority of web-enhanced courses can be developed using standard, easily available and easily used tools and platforms.

To ensure that York's e-learning initiative is a success, we propose a selection process whereby academic units submit proposals to receive enriched funding from the Provost. We suggest that approved projects should meet the following criteria:

1. *Impact*: Proposals that offer the highest benefit-cost outcomes be given priority. For example, a faculty proposal to initiate a new blended learning program would rank higher for funding than a proposal by a single faculty member to move a course online. There may, of course, be exceptions.

2. *Sustainability*: Proposals that provide a long-term commitment (e.g., three years) of online delivery be given higher priority. Maximizing York's return on investment for implementation should be a priority.

3. *Innovation*: Proposals that offer innovative approaches aimed at resolving specific educational dilemmas be considered if the pilot project or program has a good fit with

York's strategic direction. It is recommended that a pool of funding (say 20% of the budget on an annual basis) be set aside for such innovative endeavours.

STAGE 2: FACULTY DEVELOPMENT

The faculty development stage of the process is aimed at providing faculty with the knowledge and skills necessary to be successful at teaching in an alternative delivery mode. This would involve a combination of course redesign, use of new pedagogical approaches and proficiency in using the required technologies.

Formal assistance for teaching support, including the use of technology in teaching, could come centrally from the Centre for Support of Teaching, which already has a number of programs such as the Course Design Institute and workshops on the effective use of technology. Technology training/development could be provided by the UIT Learning Technology unit that currently provides workshops and one-on-one consultation in use of e-learning tools such as Moodle. However, sufficient capability and capacity to support faculty development for an expanded e-learning initiative does not yet exist and may represent the most significant challenge facing York as it moves into this arena.

Based on practice succeeding elsewhere our objective would be to put in place a formal faculty development program to will allow faculty to gain capability to teach an existing course in blended (or online) format, and to design-in characteristics to foster the educational experiences identified in the White Paper: meaningful learning, increased engagement with faculty and other students, and experiential learning components. Table 2 below summarizes some of the features of a new faculty development program:

Table 2: Faculty Development Strategies and Resource Implications

Faculty development strategies for blended learning	Resource implications (Incremental to existing)	Additional strategies for fully online courses.	Resource implications
Build on and extend our successful experience with the Course Design Institute and doTEL. Creation of an "E-Course Design Institute." Provides for course design and implementation delivered via a week long "course." Integrated pedagogical and technical support consisting of a preparatory phase (focused on course design and preparation) - E-Course Design Institute Course implementation with continuing support. Also draw on: • Formal structure of compensated peer faculty consultants. • 1 peer consultant for every 5 faculty • Participation of librarians, other experts. The approach would also incorporate: • Continuing support through delivery. • Access to online tutorials/resources. • Collaborative course review and refinement followed by a second implementation of the course and review/refinements.	Support a minimum of 50 faculty per year. Investment required for: • Development of the course curriculum and structure (developing goals and objectives and overall plan of activities, developing informational resources by integrating existing CST materials with adapted third party materials and custom materials). • Delivery of the course and associated support. • Update and ongoing maintenance of the course content. • Creation of online educational materials. • Delivery of courses and ongoing support. • Compensation for formally appointed "peer" consultants. **Estimated costs:** Low: $200,000 for 2 additional professionals with learning design/educational development skills. High: $400,000 for 4 new professionals. Support for peer consultants as above.	In keeping with the best practice model from UCF: Develop and deliver an additional "institute" that would build on the eCourse Design Institute and provide further instruction on the particular demands of "distance" delivery. • Would have to add effort to creating a support environment. • Add on development – refresher for distance. • Fundamentally the same as blended. • Ongoing support would require tools such as video conferencing for support at a distance. • Reliance of online resources/tutorials. • Over a period of years develop the right kind of resources that could be online. Ongoing investment. • Still needs to be in class to begin	Investment required to develop and deliver the institute curriculum. May not be any additional costs beyond the requirements of blended.

The follow-up support will help ensure that courses are implemented successfully, while the review and refinement process provides a mechanism for ongoing faculty and course development. The core of the "preparatory" phase will be a one week (35 hours) course that will integrate design/redesign of a course, pedagogical practices, and technology support necessary to deliver a successful blended course.			

STAGE 3: COURSE DEVELOPMENT

York already has some expertise and resources devoted to the development of e-learning courses – web enhanced, blended, and distance – although the bulk of the development is related to variant of web-enhanced courses. With respect to development and support of undergraduate and graduate courses, the largest concentration of resources exists in LA&PS and UIT Learning Technology Services. In LA&PS there are estimated to be 6 positions devoted to course development and support. In UIT LTS there are 7 positions involved in the process – including a portion committed to media support (a specialized skill set used widely throughout York).

The course development support approach varies amongst units – for example UIT LTS aims to train and coach faculty to quickly be self-sufficient (as opposed to a "do for" approach). The result of this is that a good deal of course development work is actually done by faculty members themselves or by people supporting them (including in some cases IT staff in the Faculties).

The model described below would be one that would aim to put additional support resources in place to provide for the development of approximately 100 new blended courses. Further it contemplates a somewhat more "do for" approach than currently exists.

Table 3: Course Development Strategies and Resource Implications

Course development strategies for blended learning	**Resource implications**	**Additional strategies for fully online**	**Resource implications**
• Provide technical support integrated with the E-Course Design Institute. • Follow up content creation/adaptation and migration. • Provision for creation or acquisition of specialized eLearning objects (e.g. simulations, models etc.). • Assume that some course materials would be reused each time a course is delivered. • Creation of online instructional materials (e.g. videos) and other web content.	• Very dependent upon the starting point of the course materials (e.g. existing web-enhanced course vs. traditional course). • Utilize student assistants to support some of the development work. • Redirect existing resources from current "ad hoc" development and support to the support of this program. • May look at using individuals or teams focused on different disciplines (e.g. humanities, sciences etc.). **Estimated costs:** For annual development of 100 courses. *Low*: $500,000 in additional staff (permanent full time plus students). Allows for an average of 100 hours of development support per course. May be additional material/infrastructure costs depending upon the design of the course (e.g. expand recording facilities). *High*: $1,000,000 in additional staff (permanent full time plus students). Allows for an average of 200 hours of development support per course.	• Similar to blended. • Not necessary for faculty to be on campus.	• No additional resource beyond blended.

STAGE 4: COURSE DELIVERY

This stage provides on-going support resources for faculty and students and the necessary technology infrastructure/services to provide for delivery of the course. Its features are listed below in Table 4.

Table 4: Course Delivery Strategies and Resource Implications

Support strategies for faculty delivering and students taking blended courses	**Resource implications**	**Additional strategies for fully online.**	**Resource implications**
• Facilitate the creation of peer support/ mentorship structures amongst faculty. • Rely primarily upon online tutorial and help materials to assist students. • Provide face-to-face opportunities (possibly via online video/ collaboration tools) to meet with technical and learning support staff.	• Estimate approx 5 hours per course per term for pedagogical support for faculty • Can be handled through the incremental resources noted above. As the number of courses grows additional staff could be required. • Estimate approx 5-10 hours per course through a term for technical support for faculty. • One time investment in online educational and help resources for students. • Additional training for help desk staff to support students.	• Major changes in the need for administrative support for students (e.g. exams by proxy). • Extended hours of support for faculty support – expectation of 24x7 support. • Needs to be one location for all.	• To be identified.

STAGE 5: ASSESSMENT

Follow up action is an essential part of the model to ensure that courses and support meets White Paper e-learning objectives such as enhancing the student learning experience. Its features are given below.

Table 5: Assessment Strategies and Resource Implications

Support strategies for faculty delivering and students taking blended courses	**Resource implications**	**Additional strategies for fully online**	**Resource implications**
• Evaluation instruments and methods supplemented to provide detailed, diagnostic information for ongoing enhancement to courses • Interpretation of evaluation data for individual courses, and collaborative development of responses by instructor, educational and technological support • Monitoring of evaluation data for overarching themes and common issues, to inform enhancement of technical and educational support for course design, development and implementation	• Technical - make additional evaluation instruments and report-back available online, collaboration with technical issues for ongoing enhancement. Estimate costs - one-time development/ implementation, with ongoing updates as needed • Educational - conduct arms-length evaluations, analyze results, and support faculty with redesign. Estimated costs = 5 hours/course/term. Covered within incremental resources identified elsewhere.	None	No additional resources beyond blended.

Technology Infrastructure Support

In addition to the human resource supports required for the e-learning initiative described in the model above, consideration must be given to technology infrastructure at York. Our assessment is that the majority of technologies are already in place; however, some scaling up is required depending on what the course design/delivery demands are. The infrastructure and resource implications are summarized in Table 6 below.

Table 6: Technology Infrastructure Resource Implications

Technology infrastructure for blended learning	Resource implications	Additional strategies for fully online.	Resource implications
In terms of reliance upon technology, blended courses closely resemble well-developed web-enhanced courses. The existing fundamental infrastructure (e.g. learning management system, network, web servers etc.) should be adequate to support the additional courses. There may be additional costs depending upon the design of courses and their content, in particular for provision of streamed video and or podcasts.	The goal would be to create a variable cost scheme to provide for a sustainable, scalable model to support technology infrastructure. Direct allocation of costs where applicable (e.g. staff time to record lectures) as per current practice. For example: • $2 per student for basic LMS (Moodle) support/access. • $150 per course for use of synchronous online meeting tools (e.g. Adobe Connect)	May require some additional technologies depending upon the approach – for example synchronous video or meeting platform for online "office hours".	Unknown and dependent upon course design. Aim to charge out on a per course basis.

VII. Revenue and Cost Summary for the e-Learning Initiative

In this section, we will discuss possible revenue sources that could be derived from the e-learning initiative and summarize the costs to support the initiative that are detailed above. For the purposes of this discussion, we will base revenue and costing calculations on the assumption that the university will restructure or develop 100 e-learning courses per year over the next five years, resulting in a total of 500 e-learning courses. While seemly ambitious, this would result in only approximately 12% of all York courses being offered in a partial or a fully online format in five years. The reality may well be that restructuring 100 courses per year is beyond York's human and fiscal capacity. For example, the University of Central Florida, a model used throughout this report, is able to prepare only 80 faculty per year to restructure their courses to be blended or fully online. Another assumption in this section is that each of the newly restructured courses will have 100 students enrolled. Detailed revenue and cost calculations are given in Appendix D.

Revenue and Cost Avoidance

If all of the projected courses bring in new enrolments, York would be gaining 10,000 students per year and a total of 50,000 at the end of five years. These students would generate all of the standard Basic Income Units (BIUs) and tuition that York normally accrues. In addition, we propose that an Associated Course Fee (ACF) be levied on all new courses to cover the costs of technology connected with these courses. As will be seen below, a modest ACF will cover all of the costs of technical development and ongoing support. The total revenue from all sources would be approximately $6.2 million in the first year and it would rise to $31.2 million by the fifth year (see Appendix D for details).

If the new courses were to be fully online, then no physical classroom costs would be required to accommodate these students. However, as discussed earlier in this report and summarized in Table 1, we recommend that the majority of effort be put into developing blended courses as they show more advantages overall for student access, engagement, and learning than fully online courses. Thus, there will be classroom costs associated with this initiative once the university reaches full operating capacity. If additional classrooms are built to accommodate enrolment beyond current capacity, then York will be able to avoid significant construction and maintenance costs as compared to building classrooms for teaching traditional fully face-to-face courses.

To illustrate this cost avoidance, assume that the 10,000 students are in blended courses that meet only 50% of the time that they would normally (e.g., instead of meeting twice a week for 1.5 hours, they meet only once a week for 1.5 hours and the equivalent of 1.5 hours of work is done online). The experience of UCF suggests that not all of the classroom space is fully recoverable for teaching due to scheduling conflicts; instead, about 6/10ths of the space is recoverable. Table 7 shows the potential cost avoidance using planning estimates supplied to us of 2.3 Gross Square Metres (GSM) of physical space required per Full Time Equivalent (FTE) student; building costs of $4500/GSM; and operating costs of $81/GSM.[2] [3]

[2] Estimates provided by the Vice-President Financial Affairs Division.

[3] The building costs appear to be somewhat low as the new Life Sciences building was publicly announced as costing $70 million for 160,000 sq. ft. for three floors. This translates to a cost of $4700 per sq. metre, which is about the same as the estimates provided; however, the entire building reportedly will cost in excess of $125 million. This would suggest that construction costs are significantly higher than the estimates provided.

Table 7: Estimated Cost Avoidance Stemming from Blended Courses

Item	Amount
Total enrolments	10,000
Portion of enrolments out of class	0.50
Blended recovery factor	0.60
FTE equivalent outside of class (product of above divided by 10 for one half course)	300
GSM per FTE	2.3
Capital cost per GSM	$4,500
Operating cost per GSM	$81
Capital cost avoidance on space (300 x 2.3 x 4500)	**$3,105,000**
Operating cost avoidance on space (300 x 2.3 x 81)	**$55,890**

Thus, the blended learning initiative could result in "saving" over $3.16 million in capital and operating costs compared to the same courses being offered using the traditional lecturing model. Given that York is not operating at full classroom utilization capacity, not only will the university be able to use existing capacity more effectively with blended learning, but the university will be able to use any newly constructed space (e.g., Life Sciences building) more efficiently.

Next, we summarize the two major categories of expenses that the e-learning initiative will incur: technical development, support, and technology infrastructure costs; and faculty development costs. All costing in the following sections is based on half courses and we do not anticipate and cost differential between developing fully online and blended courses where the face-to-face time is reduced to approximately 50 percent.

Expenses – Technical Development, Support, and Technology Infrastructure

This category is comprised of the costs of technical support staff that will assist faculty, for example, to create multimedia content, develop course electronic templates, convert existing course materials to digital format, and carry out other technical aspects of online course development. The category also includes the necessary hardware and software to support the offering of the online courses. There are both ongoing and one-time-only expenses in this category. For the purposes our calculations, we estimate that a one-time-only commitment of 150 hours of technical support is required to develop a course. Once the course is offered, it will require an ongoing support of 5 hours and 20 hours annually to upgrade the course. The cost of these services is approximately $75 per hour. An estimated $2 per student per year will be required for technical infrastructure. This estimate is based on the amount charged by external service providers and, it must be noted, is a baseline estimate of the cost of a basic online course without much rich

multimedia or synchronous videocasting. Table 8 below shows the cost of these services and how they may be offset after the third year by levying a $60 per student ACF. The ACF can be adjusted higher or lower depending upon when the university wishes to break even on costs; however, the point must be emphasized that all direct technology-related costs of this initiative can be covered by the ACF.

Table 8: Estimated Costs Technical Development, Support, and Infrastructure

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Cumu-lative
Cumulative no. of courses	100	200	300	400	500	
Cumulative enrolment	10,000	20,000	30,000	40,000	50,000	
OTO course development (100 courses x 150hrs x $75)	1,125,000	1,125,000	1,125,000	1,125,000	1,125,000	5,625,000
Ongoing support/upgrade (cum. no. courses x 25hrs x $75/hr.)	187,500	375,000	562,500	750,000	937,500	2,812,500
Infrastructure costs ($2 x cum. enrolment)	20,000	40,000	60,000	80,000	100,000	300,000
Total costs	1,332,500	1,540,000	1,747,500	1,955,000	2,162,500	8,737,500
ACF Revenues ($60 x cum. Enrolment)	600,000	1,200,000	1,800,000	2,400,000	3,000,000	9,000,000
Technical costs less ACF revenue (surplus)	**732,500**	**340,000**	**(52,500)**	**(445,000)**	**(837,500)**	**(262,500)**

As stated earlier in this report, we recommend that up to 20% of these funds be devoted annually to innovative and leading edge pedagogical uses of technology so that York will be seen as an innovator and leader in the field.

Expenses – Faculty Development

There are two components required to support faculty in the development of e-learning courses: compensation for their time and training costs. Faculty compensation is somewhat of a problematic issue as it is tied to intellectual property rights. Under the current YUFA collective agreement, faculty retain rights to intellectual material they develop less any portion that the university contributes to the materials. If faculty receive a token stipend or none at all, presumably they would have almost exclusive rights to the electronic course materials. In this case, if a faculty member went on sabbatical or was reassigned to teach other courses, the e-learning course would not be available to the department for someone else to teach without the faculty member's consent. This would cause problems for the department, especially if it was a required and/or a large enrolment course. Another issue is how much to incent faculty to invest the considerable time and energy required to transform a course. Opinions on this issue vary from the point of view that no incentive should be provided to the position that a course release and more be provided. As a compromise, we recommend as a minimum that faculty be paid a one-time-only stipend of $3500 per course and that consideration be given to increasing this amount considerably (e.g., $20,000 to $30,000 for high enrolment courses) if the university wishes to retain exclusive rights to the course.

In addition to a faculty stipend, there is a need to provide training to faculty on how to develop an effective e-learning course. Table 2 above provides an overview of some of the details of an e-course design institute similar to the former ArtsDoTEL program that could offer the training. We estimate the one-time-only cost of this to be approximately $3000 per course to cover the cost of instructional design consultants and leadership. Faculty will also need ongoing training as course management systems and other tools evolve and new tools become available. Therefore, an ongoing support of 5 hours is likely needed at a cost of $75 per hour.

The above faculty development costs are summarized in Table 9.

Table 9 Faculty Development Costs

Item	Year 1	Year 2	Year 3	Year 4	Year 5	Cumul-ative
Stipend per course ($3500 x 100 courses)	350,000	350,000	350,000	350,000	350,000	1,750,000
OTO course redesign cost per course ($3000 x 100 courses)	300,000	300,000	300,000	300,000	300,000	1,500,000
Ongoing support per course (5 hrs x $75 x 100/yr cumulative)	37500	75000	112500	150000	187500	562,500
Total faculty development costs	687,500	725,000	762,500	800,000	837,500	3,812,500

Several potential avenues to explore to secure funding to cover these costs include:

- Revenue from program growth.
- One-time-only grants could become available from the MTCU as the province develops programs to support the Ontario Online Institute.
- External donations and from industry partnerships.
- Re-distribution of funds “saved” from avoiding new construction costs.

Important to note is that, for an institution the size of York, the area of faculty development has been chronically underfunded and investment is required.

VIII. Priority Areas for Re-designed Courses

We feel that our role is not to determine which specific courses should be candidates for re-designing under this e-learning initiative. In section V, we outlined a process and three criteria (impact, sustainability, and innovation) for vetting course re-design proposals that

should receive support. In addition to these criteria, the university might consider supporting courses that meet one or more of the following criteria:

1. Courses in areas where York has a strong and established reputation.
2. Courses in areas where chronically insufficient student spaces are available in current face-to-face offerings.
3. Courses that are already well-established and successful in web-enhanced format.
4. High enrolment courses with the caveat that if they are first year courses, they should not be fully online.
5. Other areas of strategic importance such as professional degree programs for new or potential immigrants.

IX. Implementation Considerations

The initiative outlined in this report is ambitious—but essential—if York wishes to become a significant player in the e-learning field in Ontario. As mentioned previously, the restructuring of 100 courses per year for the near future will be a difficult undertaking for the institution. Indeed, the University may wish to phase in course restructuring by starting with a more modest goal of creating between 25 to 50 e-learning courses by September 2011. A study of this experience will then determine if it is feasible to develop a greater number of courses the following year or continue at the same development rate. Additionally, the University might want to monitor and support closely the current Faculty of Health initiative that has the goal of offering four large undergraduate courses in blended format in January 2011. Other Faculties might be encouraged to collaborate with Health in developing e-learning courses so that faculty support services and expertise could be shared. This would be a much less ambitious start than what was envisaged in the White Paper, but it would nonetheless initiate York on a path of creating a more extensive range of e-learning course offerings.

X. Summary and Conclusions

Relative to its peer institutions in Ontario and Canada, York University has lagged in offering e-learning courses in terms of both enrolment and breadth. Our analysis of the research literature and information and communications technology policies at other universities suggests that York has a unique opportunity to create a leadership role in e-learning not being filled by others—that is to specialize in blended learning. Although there may be strategic reasons for York to offer some fully online courses, we conclude that blended learning holds the most promise for the institution to set itself apart from its competitors and, at the same time, address the concerns raised in the Provostial White Paper of improving student accessibility, engagement, and learning. The blended model also provides a middle road for York to address enrolment growth without requiring the

classroom space necessary for fully face-to-face lectures and without alienating students from the campus experience that often results from fully online courses.

The report sets out an aggressive plan for York to grow in blended and online course offerings over the next five years by developing 100 courses per year. Growth of this nature would bring in substantial income from grants and tuition to York as the total enrolment could double if growth were to come from only new students. The blended model will allow the university to use the remaining existing excess classroom space more efficiently than the traditional lecture model and sizeable cost avoidance is possible when it becomes necessary for new classrooms to be built. The technology support and infrastructure costs of the plan could be covered entirely by a reasonable associated course fee. Beyond this, the university will have to invest in faculty support and development if it is to realize significant e-learning growth. Revenue sources that could offset this could come from program growth, grants, donations, industry partnerships, and re-distribution of funds "saved" from avoiding new construction costs. If the University found that it could not manage growth of this size, a more modest implementation plan could be developed; however, in doing so, York does run the risk of falling further behind other institutions in its e-learning course offerings.

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Appendix A: List of University Policies Reviewed

Canada

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Appendix B: Online Enrolments at a Glance

Total Number of Credit Distance/Online Course Offerings by Term[1]

University	Academic Year	Summer	Fall	Winter	Total
Athabasca[2]	2009/10	Not available			776
Ryerson[3]	2009/10	113	115	113	356
Waterloo[4]	2010/11	104	111	118	333
SFU[5]	2007/08	82	94	89	265
Guelph[6]	2007/08	95	67	84	246
Western[7]	2008/09	83	95		178
Ottawa[8]	2010/11	49	48	64	161
Concordia[9]	2010/11	47	37	39	123
Carleton[10]	2010/11	20	35	22	77
Queen's[11]	2010/11	28	12	18	58
Lakehead[12]	2010/11	20	35	21	76
Nipissing[13]	2009/10	23	20	18	61
UOIT[14]	2009/10	NA			8
McMaster[15]	2009/10	Not offered			0
U of T		Not available			

Notes:

[1] Includes the latest data available, predominantly undergraduate-level courses, various academic years.
[2] Includes undergraduate and graduate courses, as well as non-credit continuing education courses. Source: AU Business Plan, 2010
[3] Includes 303 distance and 53 hybrid courses in total. Source: Ryerson University: The Chang School: Courses and Programs (website)
[4] Includes 23 graduate level courses. Online/Distance courses at UW are offered in three modes: web, mp3, and multimodal. Source: UW Centre for Extended Learning: List of Online Courses (website)
[5] Source: SFU Institutional Research and Planning: Table CS-02, Number of Undergraduate Sections Taught by Year, Faculty, Department, Location and Semester
[6] Includes Main Campus courses. Source: 2007/08 Annual Statistical Report: Table 3.3, Distance Education Courses Taught by Department and College
[7] Includes full and half undergraduate courses taught. Source**:** Office of Institutional Planning & Budgeting: Western Databook 2009
[8] Includes online courses being offered by Faculties of Education, Health Sciences, and Social Sciences. Source: Centre for eLearning: Online Courses (website)

[9] Source: eConcordia: Credit Courses (website)
[10] Includes full and half CUTV courses (formerly ITV) recorded and broadcasted on the Internet and on television; students virtually attend classes by viewing the recorded lectures and by participating online. Source: Carleton University Television: CUTV Courses (website)
[11] Source: Office of Continuing and Distance Studies: Distance Courses (website)
[12] Includes full and half courses. Source: Office of Continuing Education and Distributed Learning: Distributed Learning Courses (website)
[13] Source: Centre for Continuing Education: Distance Education Courses (website)
[14] Source: UOIT Online: Online Courses
[15] Source: Registrar's Office, by phone, June 08, 2010

Total Enrolments (Head Counts) in Credit Distance/Online Courses by Academic Year[1]

University	2009-10	2008-09	2007-08
Athabasca[2]	Not available	72, 040	68,850
Ryerson[3]	58,276	59,919	58,050
Concordia[4]	~ 25,000	~ 13,000	Not available
Waterloo[5]	21,311	17,673	16,451
Guelph[6]	Not available	Not available	20,030
SFU[7]	10,812	Not available	Not available
Carleton[8]	9,058	9,557	10,063
Western[9]	Not available	5,711	5,652
Ottawa	Not available		
U of T	Not available		

Notes:

[1] Includes the latest data available, representing predominantly undergraduate registrants, various academic years. Queen's, Lakehead, Nipissing, and UOIT are not included as the data is not available.
[2] Includes students registered in a total of individual courses at both undergraduate and graduate levels. Source: AU Annual Report, 2008-09 and AU Annual Report, 2007-08.
[3]Includes students registered for credit classroom-based, distance, and hybrid courses. Source: University Planning Office: Ryerson Key Statistics: Continuing Education Division Students.
[4] Source: The Link, Concordia's newspaper, http://www.thelinknewspaper.ca/articles/1825
[5] Includes graduate students (637, 592, and 449 respectively). Source: UW Institutional Analysis & Planning: University Data
[6] Main Campus enrolment. Source: 2007/08 Annual Statistical Report: Table 1.13, Course Enrolments in Credit Distance Education Courses and Regular Courses.
[7] Source: SFU Institutional Research and Planning: Table ST-40, Undergraduate Headcount by Location of Courses Taken, 2009/10.
[8] Source: Carleton Office of Institutional Research and Planning: University Statistics
[9] Source: UWO Office of Institutional Planning & Budgeting: Institutional Data & Analysis

Enrolments (Head Counts) in Credit Distance/Online Courses by Term[1]

	Academic Year	Spring/Summer	Fall	Winter	Total
Waterloo[2]	2009/10	5,881	6,950	8,480	21,311
Guelph[3]	2007	6,073	5,666	8,000	19,739
SFU[4]	2009/10	3,628	3,621	3,563	10,812
Carleton[5]	2010/11	1,416	7,642		9,058
Western[6]	2008/09	2,600	3,111		5,711

Notes:

[1] Includes the latest data available, representing predominantly undergraduate registrants, various academic years.
[2] Includes graduate students. Source: UW Institutional Analysis & Planning: University Data
[3] Includes Winter 2007, Summer 2007, and Fall 2007. Source: Open Learning at the University of Guelph 2007 Annual Report
[4] Source: SFU Institutional Research and Planning: Table ST-40, Undergraduate Headcount by Location of Courses Taken, 2009/10.
[5] Source: Carleton Office of Institutional Research and Planning: University Statistics
[6] Source: UWO Office of Institutional Planning & Budgeting: Institutional Data & Analysis

Distance/Online Enrolments Patterns by Academic Programs

	Guelph[1], 2007/08	Waterloo[2], 2009/10	Carleton[3], 2009/10	Western[4], 2008/09
1.	Psychology (3,424)	English Language & Literature (2,260)	Psychology (2,477)	Psychology (1,342)
2.	Computing & Information Science (1,696)	French Studies (1,663)	Biology (1,676)	English (750)
3.	Sociology & Anthropology (1,428)	Psychology (1,483)	Law (1,078)	Physiology & Pharmacology
4.	Integrative Biology (1,377)	Religious Studies (1,427)		
5.	Marketing & Consumer Studies (1,328)	Philosophy (919)		
6.	History (1,223)			
7.	Geography (1,109)			

Notes:
[1] Source: Open Learning at the University of Guelph 2007 Annual Report
[2] Source: UW Institutional Analysis & Planning: University Data
[3] Source: Carleton Office of Institutional Research and Planning: University Statistics
[4] Source: UWO Office of Institutional Planning & Budgeting: Institutional Data & Analysis

Appendix C: Net Savings in Commuting Time for Online Sessions

The calculations used in deriving the net transit savings expressed in terms commuting times and expenses for the fully online delivery model are presented below.

- 63% of commuting students choose to drive with an average return commute of 59 kms. This needs to be adjusted downwards given that only 70% of students commute by themselves and that carpool vehicles would be traveling regardless. Also, students are only on campus an average of 0.94 days per week per course. This yields an average adjusted commute per session of 38.8 kms (59*.7*.94). Using the CRA mileage allowance of $0.46/km yields an average savings per course session/meet moved on line of $17.86.
- 37% of commuting students choose to use public transit. Of these, 59% pay per ride ($6 return) and 41% purchase monthly passes ($4.99 return). Thus, the average return fare is $5.58, but this needs to be adjusted downwards given that students are only on campus an average of 0.94 days per week per course. This yields an average return expense and savings per course session/meet moved on line of $5.25.
- With 63% of commuting students traveling by private vehicle and 37% using public transit, the average savings per course session/meet moved on line of $13.19 (0.63*17.86+0.37*5.25). This needs to be adjusted downwards given that only approximately 85% of students commute. **Accordingly, the net savings per course session/meet moved on line would approximate $11.22.**
- 63% of commuting students choose to drive with an average return commuting time of 1.2 hours. This needs to be adjusted downwards given that students are only on campus an average of 0.94 days per week per course. This yields an average adjusted commuting time and, therefore, time savings per course session/meet moved on line of 1.1 hours.
- 37% of commuting students choose to use public transit with an average return commuting time of 2.2 hours. This needs to be adjusted downwards given that students are only on campus an average of 0.94 days per week per course. This yields an average adjusted commuting time and, therefore, time savings per course session/meet moved on line of 2.1 hours.
- With 63% of commuting students traveling by private vehicle and 37% using public transit, the average time savings per course session/meet moved on line is 1.5 hours (.63*1.1+.37*2.1). This needs to be adjusted downwards given that only approximately 85% of students commute. **Accordingly, the net time savings per course session/meet moved on line would approximate 1.25 hours.**

Appendix D Estimated Revenues and Costs for e-Learning Initiative

	Year 1	Year 2	Year 3	Year 4	Year 5	Cumulative
New Courses	100	100	100	100	100	
Course upgrades (3 year)	0	0	30	60	100	
Cumulative Courses offered	100	200	300	400	500	
Revenues:						
Average enrolment	100	100	100	100	100	
ACF	50					
ACF Revenues	500,000	1,000,000	1,500,000	2,000,000	2,500,000	7,500,000
Average Tuition Fee per Course Enrolment	498	518	539	561	584	
Tuition Revenues (all in revenue to the institution)	4,975,000	10,357,950	16,173,939	22,449,427	29,212,317	83,168,633
Average Grant per Course Enrolment	625	625	625	625	625	
Grant Revenues (all in revenue to the institution)	6,247,700	12,495,400	18,743,100	24,990,800	31,238,500	93,715,500
Expenses:						
Faculty development						
Stipend per course	3,500					
Course redesign cost per course	3,000					
ongoing support per course 5 hrs	375					
Total Faculty development	687,500	725,000	762,500	800,000	837,500	3,812,500
Technical development and support:						
Development hours per course	150					
Upgrade hours per course	20					
Ongoing support hours per course	5					
Per hour cost	50					
Total technical development and support	775,000	800,000	855,000	910,000	975,000	4,315,000
Technology infrastructure costs ($2/student)	20,000	40,000	60,000	80,000	100,000	300,000
Total Technical/Technology Costs	795,000	840,000	915,000	990,000	1,075,000	4,615,000

Cost Avoidance (based on GSM per FTE) -						
Total enrolments	10,000					
Portion of enrolments out of class	0.50					
Blended recovery factor	0.60					
FTE equivalent outside of class	300					
GSM per FTE	2.3					
Capital cost per GSM	4,500					
Operating cost per GSM	81					
Capital "Savings" on space	3,105,000					
Operating "Savings" on space	55,890					