

REDUCING COSTS THROUGH ONLINE LEARNING

**Five Proven Strategies from the US,
Canada, the UK and Australia
2013**

NO “YES” OR “NO” ANSWER

One of the key questions for educators, administrators, and policy makers today concerns whether online learning can truly reduce costs for institutions while offering students increased access and equal or enhanced quality. As has been stated in a companion look at this question, [Online Learning as a Possible Cost Saving Measure: What Canadian Researchers Tell Us](#): “The consensus seems to be that no amount of research will ever result in a ‘yes’ or ‘no’ answer to the question of whether or not online learning saves money while maintaining quality.” Instead, to quote the summation coined by Dr. Tony Bates: “It all depends.”

However, through experience in universities and colleges much has been learned about the potential and realities of cost saving through the application of various components of online learning. Through an investigation of current practices in the field, especially those in the U.S., we have found numerous successful strategies and some interesting possibilities for cost savings and cost effectiveness through online learning.

Each of these possibilities has benefits and challenges and they are offered for consideration by administrators, policy makers, and funders in the broader context of educational quality, student access and success, faculty capacity and support, and provincial and institutional priorities.

WHAT CURRENT PRACTICE TELLS US

Experience has indicated that institutions can contain or reduce their costs with online learning through adopting strategies to:

1. Improve teaching and learning efficiency;
2. Reduce development and support costs through shared services;
3. Integrate new sources of educational content;
4. Reduce space and infrastructure costs; and
5. Uncover new revenue streams.

Each of these is examined below to demonstrate how it is related to productivity improvements and/or cost reductions while sustaining quality and access. The institutional elements that make this possible are emphasized. Some of these productivity and cost impacts are possible in today’s environment, and others hold promise for the future.

Before discussing cost-effectiveness it is essential to establish that quality is not sacrificed with online learning. Fortunately for the potential of online learning technologies to change the cost equation, a large body of research contradicts the fear that online learning cannot meet the standards of the classroom. A watershed finding came in 2010 when a U.S. Department of Education meta-analysis concluded that “students in online conditions performed modestly better, on average, than those

learning the same material through traditional face-to-face instruction” (Means et al., 2010).

1. Improve Teaching and Learning Efficiency

Institutions can support the development and adoption of technology tools that help students to master material independently.

Course designs can integrate the use of technology that supports student mastery of information, interaction with each other, engagement with learning, involvement in peer assessment, access to support for assignment preparation, self-testing and revision, and a myriad of other tasks that enhance learning success. Improving the effectiveness of student independent study can allow faculty time to be redirected to other tasks in the college or university.

Technology-Enabled Course Redesign: Online study can help with costs by allowing students to master course material on their own through interactive tools. This is a key element in the redesign of large- enrollment introductory courses conducted since 1999 by the U.S.-based National Center for Academic Transformation (NCAT). Through supplementary or substitutive use of electronic tools (sometimes backed by on-demand tutoring), 30 NCAT course redesigns conducted between 1999 and 2004 produced an average 37% reduction in per-student instructional costs compared to previous classroom- based methods. In all cases the redesigned courses delivered improved or equivalent learning outcomes (National Center for Academic Transformation 2005a, Twigg, 2003).

Cost savings largely came from reduced demand for faculty time or substitution of less expensive instructional assistance, such as graduate assistants or peer tutors. A 2012 survey of 25 of the original institutions reported that at 22, the redesigned courses were still being offered in substantially the same way (Rosenthal and Weitz, 2012), and none of the respondents said that staffing needs had increased since the redesign.

A New Generation of Interactive Tools: Since the NCAT work began, interactive learning tools have continued to evolve. One much-discussed project is the Online Learning Initiative (OLI) at Carnegie Mellon University, a grant-funded project that is building a new generation of online courses employing technologies like intelligent tutoring systems, virtual laboratories, and embedded assessments.

To date the OLI initiative has made 16 courses freely available to students and institutions, with more in development. Studies of OLI’s introductory statistics course report that students learn the material significantly faster than those in traditional courses, with equal or better outcomes (Lovett, Meyer, and Thille, 2008; Bowen et al. 2012). These results held up even among low-income and first-generation students, challenging the assumption that only the best-prepared students can benefit from interactive learning technologies. One

study's authors estimate that implementing similar interactive online tools in a hybrid setting could reduce instructor costs from 19% to 57%, depending on the teaching model used.

Massive Open Online Courses: At the forefront of the effort to find new ways to teach large numbers of students efficiently is the massive open online course (MOOC). MOOCs are essentially online courses designed to reach a mass audience at very low—indeed, no—cost to the student. In the U.S., Antioch University – Los Angeles has become the first to offer academic credit for some MOOCs today, and the Gates Foundation has funded a study by the American Council on Education to explore the feasibility and issues associated with that organization certifying course equivalency through its ACE CREDIT division.

Though typically developed and overseen by experienced (often eminent) academics, MOOCs are not yet attempting to provide personal interaction between instructor and student. They present lectures in easily-consumable video “chunks,” make use of automated grading, and turn large class enrollments to advantage by using social networking for interaction, peer grading, and tutoring. Fortified, similar to the OLI project mentioned above, by new technologies such as intelligent tutoring and embedded assessments, MOOCs could take a long step toward reaching the economic model that characterizes many digital products: zero additional production cost per each additional consumer. Even if they don't get that far, they could introduce improvements in instructional efficiency that will be of interest to all colleges and universities.

Lacking a clear revenue model and authority strategy or willingness to award credit directly, today's MOOCs are still evolving. But at their scale of operations, relatively modest ancillary fees (as for tutoring or assessments) could supply viable revenues, and possibilities are developing for institutional credit arrangements. And the leadership of the elite research universities in this mode of delivery is an unmistakable signal that online learning's time has arrived.

High-Potential Emerging Technologies: Efforts like those described above provide a foundation for optimism about further potential for realizing cost savings. Emerging technologies to improve instructional efficiency include:

- adaptive assessment engines that shape lessons to address students' learning needs;
- new learning management systems and content platforms that track students' learning behaviors in detail, permitting better real-time analysis of learning;
- artificial intelligence systems that can score student assignments and help instructors identify interventions; and
- learning analytics – particularly predictive analytics – that uncover the variables that contribute to student success,

thereby pointing out possibilities for the improvement of retention, completion, and graduation rates and hence institutional efficiency. Increasing completion, retention, and graduation means a potential to lower the institutional cost per qualified student – the key metric of institutional cost.

2. Reduce Development and Support Costs through Shared Services

Online learning lends itself to system- or consortium-wide sharing of infrastructure and support services traditionally provided by self-sufficient institutions.

Reducing the duplication of courses and delivery infrastructure on separate campuses can be a key contributor to cost containment. There is a real need for intellectual diversity and freedom of faculty choice, but the digital world offers cheap communications, easy reproduction and distribution of content, and the ability to assemble expertise and students virtually. Online learning, in the long run, may be institutionally valuable as a means for colleges and universities to retain vigorous and deep curricula and services through cooperation and collaboration. In this way, the core academic enterprise can begin to re-fashion itself as libraries have done. Academic libraries have concluded that coordinated specialization, deep collaboration, and a small number of collection-of-record libraries can combine to ensure continued access to library materials at a vastly reduced cost to participating institutions, government, and society.

Moving to the Cloud: Historically, colleges and universities have deployed information and communications technologies locally. New hosted or cloud-based services offer the capacity to spread costs over more participants. Increasingly, student academic services such as counseling, tutoring, testing, and others – and the infrastructures they depend on – can be shared among post-secondary providers with common student support needs. Such services are becoming more available in the broader marketplace, making it possible for colleges and universities to evaluate the service quality and costs in a competitive market context.

Consortia for Technology Infrastructure: Provincial, state, and system-wide consortia, often originally developed around networking needs, have evolved to provide a wider range of infrastructure services. The BCcampus consortium, for example, offers LMS hosting and other technology services to dozens of member institutions. One U.S. distance learning consortium estimates that its LMS hosting service can save a member institution over \$300,000 annually, mainly by reducing ITC staffing needs (Corcoran, 2009). Such organizations in the U.S. operate in states including New York, Connecticut, Florida, Ohio, Utah, and California, while other large-scale efforts globally include Open Universities Australia (seven shareholder and fourteen other provider institutions), Asia e University (based in Malaysia and operating in 26 countries), and ChinaEdu (online learning services for 26 public universities).

Course Pooling and Sharing: The most successful example of cost-effectiveness through cooperation from the first generation of web-based online learning was aggregator portals like Contact North | Contact Nord, OntarioLearn, eCampus Alberta, and numerous others in North America and elsewhere, which help students discover and access online courses and programs from multiple sources. These virtual catalogs allow institutions to widen the scope of student choice without having to staff marginal courses or overload popular ones. Institutions can share courses, avoid expensive duplication, and make low registration courses viable through enrolments across several colleges or universities.

Shared Development and Services: Consortium- and system-wide sharing is moving on to other academic services, including instructional design, faculty professional development, quality assessment, library services, and assorted student services, including tutoring. Some, for example, offer online services that help students apply to and transfer between institutions more easily (10 University of California campuses), operate an open educational resources repository (Hathi Trust), or share writing assistance, plagiarism detection services, and others. BCcampus estimates that its online library reference service for post-secondary students collectively saves members \$3 million annually (BCcampus, 2012). Open Universities Australia's Center for Online Learning Excellence helps course- providing institutions with learning design and professional development, including an award-winning instructor training program (Open Universities Australia, 2011).

System-wide Collaboration: A project now underway at the University System of Georgia illustrates the potential of full-spectrum technical, pedagogical, and administrative collaboration. The initiative will create a suite of online bachelor's degrees by building on the success of USG's eCore, an online core curriculum guaranteed for transfer to USG four-year institutions. The financially self-sustaining eCore organization provides LMS hosting, course design consultation, testing, and other shared services, while courses are developed and taught by USG faculty at nine campuses. Revenues are split between eCore and the campuses. In the new program, instructional costs will be held down by making extensive use of self-paced, outcomes-based courses alongside synchronous instructor-guided courses. USG estimates that in five years, the new program can achieve a per-student instructional cost of \$5,000, a little over half the current \$9,700 average at USG campuses. Correspondingly, student fees will be about 25% lower (Board of Regents of the University System of Georgia, 2012). Other examples of system-wide and inter-state cooperation can be found in the Contact North series on Game Changers in Online Learning, which features [The Kentucky Community and Technical College System](#), the [Colorado Community College System](#), and [Western Governors University](#).

Toward Larger-Scale Cooperation: The appeal of online learning collaboration recently led a task force of UK higher education

authorities to recommend a government investment of £100 million over five years to “facilitate the development and building of consortia to achieve scale and brand in online learning” (Online Learning Task Force, 2011). The challenges of aligning incentives between collaborators, who are also often competitors, will undoubtedly frustrate some joint efforts, but those who succeed at moving the cost basis of online learning beyond campus boundaries will earn a huge competitive advantage while improving access for all students.

3. Integrate New Sources of Educational Content

Open content creation models take advantage of digital formats and distribution to reduce the cost of textbooks and other educational resources.

Another aspect of sharing promoted in recent years is the creation of educational resources under Creative Commons licenses permitting “open” use and adaptation, without royalties or fees. Motivated in part by the high cost of commercially-produced resources, the open educational resources (OER) movement in the U.S. looks to foundation grants and government support, as well as altruistic contributions, to produce high-quality academic content that can be distributed free or at very low cost. OERs now feature in every discussion about educational access and cost, fortified by a United Nations declaration in their favor and by a string of interesting demonstration projects (Atkins, Brown, and Hammond, 2007).

Availability: OERs can be produced in any medium, but many are web-based, and almost all are created and distributed in digital form. A prominent part of the movement has been the creation of online discovery tools and repositories such as the [OER Commons](#) and [MERLOT](#); another is the more general promotion of access to the networks and other digital resources that make OERs available.

Integrating OERs: OERs used in online learning can reduce instructional costs in different ways:

- Some actually are online courses that institutions can introduce into their curricula, like the Open Learning Initiative courses already discussed.
- Others are shareable modular components like readings, exercises, demonstrations, models, or assessments that institutions can integrate to build courses. Using tools like these avoids the expense of buying or building content.

Notwithstanding this potential, there is a dearth of rigorous studies demonstrating OER cost savings in post-secondary education over the long term, especially for institutional, as opposed to student, costs.

Savings for Students: Experiments at system-wide levels reinforce the idea that OERs can save students money. The Washington state community and technical colleges estimate that just one year after creating an Open Course Library built around OERs, students

in the system had already saved over \$1 million in textbook costs. The colleges anticipate that using OERs in a single high-enrollment English course will save \$4.7 million per year (Washington State Board for Community and Technical Colleges, 2011). Projected savings in the University System of Georgia's low-cost online BA initiative stem in part from use of OERs.

Looking Ahead: OERs can address at least certain high-demand educational needs, especially in introductory courses. From the standpoint of online education overall, OERs are only one end of the spectrum of emerging educational content that exploits centralized production and digital distribution. Cost reductions in many NCAT course redesigns, for example, depend on the use of commercial online self-study tools. Publishers like Pearson, Cengage, McGraw-Hill, and others are investing heavily in a new generation of such tools.

4. Reduce Space and Infrastructure Costs

Online study reduces demand for expensive classroom space and campus infrastructure.

While students in all forms of online learning take courses, use library resources, participate in discussions, and consume student services, in most cases, they do so without consuming scarce and expensive campus “places.” Online and hybrid classes relieve pressure for classroom space, parking, and a host of other drivers of cost. They also reduce pressures on campus utility systems, another major driver of post-secondary education costs. One study at the University of British Columbia estimated that converting four large lecture-style courses to online delivery would reduce the number of classrooms occupied at peak hours by 15% (Bourlova and Bullen, 2005). After redesigning several popular courses from classroom-only to hybrid delivery, the University of Central Florida was able to cut the number of course sections housed in rented space annually from 65-70 to 33 (National Center for Academic Transformation, 2005b). The University of Minnesota – Twin Cities opted against creating new lecture halls in recognition of emerging new technology-mediated pedagogies such as blended learning.

Some institutions will benefit more than others, as cost savings will be most easily achieved where institutions are at the limit of capacity and must either rent space or build more.

5. Uncover New Revenue Streams

Online learning can help increase and diversify institutional revenues while expanding access.

In addition to direct savings brought about through online learning, online offerings can help offset institutional costs by attracting revenues and expanding the student base. Online learning has become a very big business. For the last decade, U.S. higher education enrollments in online courses have grown at 10 times the

rate in traditional ones (Allen and Seaman, 2011). Today nearly a third of U.S. college and university students take at least one online course annually. One roundup of 2007-2009 online enrollment statistics (Canadian Virtual University, 2012) placed Canada at the low end at 4% of post- secondary enrollments, with other developed nations ranging from at 11% (USA) to 25% (Sweden).

Revenues for Online Registrations: While reliable global revenue figures do not seem to be available, it is clear that a lot of money is on the table. The USA's largest provider of online instruction, the University of Phoenix Online, probably derived at least half of its \$3.88 billion revenues in 2011-2012 from online modalities (Apollo Group, 2012). The predominance (and quality concerns) of the for-profit sector in the U.S. has attracted much attention, but online learning provides sustaining revenues to a wide variety of nonprofit North American institutions. Successful online programs are offered by purely distance learning institutions (Athabasca University, TELUQ), research universities (Penn State World Campus), comprehensive universities (University of Maryland – University College), private liberal arts universities (Regis University), and community colleges (Colorado Community Colleges Online).

Emergent Revenue Sources: A more speculative possibility for improving the economics of instruction lies in attracting new kinds of revenues. Here MOOCs may offer some opportunities. Accredited institutions may join the MOOC ecosystem by offering ancillary services such as instructional support, testing, and, of course, credit award. Services like these may prove increasingly important as competition from the expanding universe of low-cost Internet-based alternatives puts pressure on core tuition.

FOUR CONDITIONS FOR SUCCESS

Online learning fought a hard but successful battle to demonstrate that it could meet the educational quality standards of classroom instruction. Thanks to the spreading (though still not universal) availability of broadband networks and other key tools in the developed countries, online learning has also made real gains in extending access to populations who have no other opportunity for post- secondary study.

A remaining challenge involves acting on what we have learned in nearly two decades of research and practical experience to use online learning to achieve cost savings or increase cost effectiveness.

The particular advantages of online instruction compared to older forms of distance learning—real-time interactivity, low-cost reproducibility, and capacity for assembling social networks—provide a promising basis for reducing the costs of teaching and learning. At the same time, to realize these advantages, colleges and universities will have to incorporate new tools into the curriculum, share costs for development and delivery, and take advantage of freely-available resources.

Based on successes already attained and a recognized need for new solutions, there is cause for optimism. Realizing the possibilities will require:

- Redesigning academic and business processes for the online environment. The free information flow and virtual communities of the Internet era can support a more open approach to course development, infrastructure, and academic support. Institutions can work together to share costs. Likewise, to allow students to take best advantage of online learning opportunities and avoid wasteful course repetitions, institutions need to develop smoother and more predictable credit articulation, and expand recognition of non-traditional prior learning.
- Preparing the faculty. Online teaching requires different and more explicit pedagogical strategies than the familiar techniques of the classroom. While the spread of online learning is constantly enlarging the pipeline of instructors who have themselves taken online courses, online remains an unfamiliar environment for many. Colleges and universities need to train instructors in theories and techniques, and incorporate tools, that have been shown to result in better, more cost-effective learning outcomes.
- Expanding the range of educational partners. Online learning consortia, OER collaboratives, informal Internet-based learning opportunities, social networks, MOOCs—these and other educational options are expanding the range of learning providers both within and outside of the post-secondary sector. In the meantime, some traditional partners, including academic publishers, are themselves undergoing transformation and financial stress. Changing cost dynamics through online learning includes drawing on educational content from a diverse variety of sources, as well as looking to partners and possibilities beyond the post-secondary sector.
- More and better research. It is a cliché to conclude any evaluation of a thorny problem by saying that “more research is needed.” But in fact, the field of online learning would benefit from more well-designed studies. The breakthrough U.S. Department of Education meta-analysis that provides the strongest evidence of superior outcomes in online learning examined 1,132 studies and found only 46 that met its high quality standards (Means et al, 2010). A 2006 survey of Canadian online learning research reported that “studies that can help us understand ‘what works’ in online learning settings are underrepresented in the Canadian research literature” (Abrami et al., 2006). While there is valuable evidence about techniques for containing cost without sacrificing quality, much more remains to be learned and shared.

NO PANACEA

Online learning can, under the right circumstances, help contain some postsecondary education costs without compromising quality, while promising new levels of access. Changes looming on the horizon for post-secondary education have the potential to deliver significant improvements in productivity both for students and for colleges and universities. Princeton University President Emeritus William Bowen, one of the pioneer researchers of “cost disease” in higher education and a former skeptic about technology’s ability to turn it around, has recently pronounced himself a “convert,” saying that online learning, though no panacea, can “in many of its manifestations [lead] to good learning outcomes at lower cost” (Bowen, 2012).

We must also keep in mind the admonition of Harvard University’s Howard Gardner (2012) to “embrace distance learning while maintaining [educational] communities with society’s most admirable values.” Our challenge is to both continue with productivity and cost reduction initiatives without losing sight of our primary purposes of spreading education to develop our society and workforce, and promote civility and an enlightened citizenry.

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