

Improving Institutional Performance The Necessary Role of IT-Enabled Innovation*

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Abstract

Recent reports and articles substantiate the growing external and internal pressure on most nonprofit colleges and universities to improve institutional performance. Indeed, nonprofit institutions are arguably obligated to improve academic productivity—e.g., to improve core mission performance indicators while reducing or stabilizing unit costs in the process and, thereby, stabilizing tuition rates. Such simultaneous improvements in academic results and unit cost structures require innovations that use technology to redesign academic and administrative services. This necessary, but not sufficient, role of technology has been demonstrated, but has not been broadly embraced and practiced. This report articulates the necessary role of technology in improving academic outcomes while simultaneously reducing unit costs, describes proven strategies and successful examples, and offers guidance to leaders willing to engage the process of recreating their institutions—a process more likely to “lift all boats” when engaged and pursued internally than when mandated externally.

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Executive Summary

A recent report from the National Innovation Initiative (NII) calls for an “innovation infrastructure” as the foundation for the nation’s future productivity and competitiveness.¹ The report notes that,

“Innovation generates the productivity that economists estimate has accounted for half of U.S. GDP growth over the past 50 years. ... It’s not only about offering new products and services, but also improving them and making them more affordable.”

While not ignoring nonprofit organizations and even targeting the nonprofit health-care industry, the NII report is curiously silent on any need for innovation and its byproduct, productivity, in nonprofit higher education’s core educational mission. In contrast, the National Commission on Accountability in Higher Education (NCAHE) transmitted its final report with a clear statement of belief that,

“improved accountability for better results is imperative, but how to improve accountability in higher education is not so obvious.”²

By creating a national “commission on the future of higher education,” Secretary of Education Margaret Spellings has signaled that improved accountability is indeed an imperative but also an obligation not to be ducked as blithely as did the NCAHE.³ I too agree that improved accountability in higher education is imperative. I take issue with the second part of the NCAHE’s conclusion, however, for I believe that the way to improve accountability in nonprofit higher education is clear by now: use information technology (IT) innovatively to redesign academic and administrative services, including instruction, for improved effectiveness and efficiency—improved “academic productivity” in the language of the NCAHE. This paper cites proven innovations and practices while expanding on a line of thought captured in two recent publications 1) to explain why improved accountability requires the innovation leverage of IT and 2) to promote two proven, innovation strategies for improving accountability through IT-enabled service process redesign.^{4, 5}

While the NCAHE report failed to elaborate a role for IT in improving accountability, it cited the possibility of “reducing costs and increasing quality by using technology in high-enrollment courses where economies of scale justify development costs,” and may have intended a role for technology in its recommendation for “re-engineering support and administrative services for greater efficiency, including centralization, decentralization, outsourcing, collaborative purchasing, and resource sharing.” We flesh out these two actionable suggestions in this paper as the common course redesign strategy and the flex program and service redesign strategy. These strategies use IT innovatively to improve accountability whenever measurably improved academic results and reduced unit costs are simultaneous goals—which they almost always must be in order to achieve the increased academic productivity called for in the NCAHE report. Applied systematically, the common course redesign strategy alone could decrease institutional expenses by up to ten percent—a figure we derive in this paper, based on the proven methodologies and results pioneered by the National Center for Academic Transformation.⁶

Deployed on an initiative by initiative basis, mission-appropriate variations on the common course redesign and flex program and service redesign strategies can support a strategy of simultaneity for systematically improving strategic academic results while also reducing their unit costs—thereby holding the line on tuition increases in the interest of affordable access. As suggested in the above quote from the NII report, there are parallels in the national service (and production) economy to the strategy of simultaneity in higher education that we advocate.

Indeed, as a key national economic performance indicator, productivity increased at an annual average rate of 3.55 percent from 2000 to 2003, a full percentage point higher than the average from 1948 to 2000 and also greater than the average for any decade in the past 50 years.⁷ This remarkable increase in productivity derived from

¹ Innovate America: Thriving in a World of Challenge and Change, final report of the National Innovation Initiative, Council on Competitiveness (Dec 2004).

² Accountability for Better Results: A National Imperative for Higher Education, final report from the National Commission on Accountability in Higher Education (Mar. 2005), State Higher Education Executive Officers, <http://www.sheeo.org/account/accountability.pdf>

³ See the announcement at <http://www.ed.gov/news/pressreleases/2005/09/09192005.html>.

⁴ Order the Change, and Change the Order, William H. Graves, *Campus Technology* Vol.18, No. 3 (Nov. 2004), 24-26, <http://www.campus-technology.com/article.asp?id=10204>

⁵ Strategies for Using Information Technology to Improve Institutional Performance: An Interview with William H. Graves by James Morrison, *Innovate* Vol. 1, No. 2 (Dec. 2004/Jan. 2005), <http://innovateonline.info/index.php?view=article&id=21>

⁶ See www.theNCAT.org (or www.center.rpi.edu) and the discussion of average cost savings on page 30 of *Improving Learning and Reducing Costs: New Models for Online Learning*, Carol A. Twigg, *EDUCAUSE Review* Vol. 38 No. 5 (Sep./Oct. 2003), 28-38, <http://www.educause.edu/ir/library/pdf/erm0352.pdf>.

⁷ Reprogrammed: Blazing gain in productivity means some jobs are no longer needed, Vikas Bajaj, *Dallas Morning News*, Oct. 10, 2004, 1D

innovations that used technology to redesign service and production processes for simultaneous improvements in efficiency, quality, and competitiveness in a globally connected economy. Downsizing sometimes resulted, not because of productivity increases, but because productivity increases occurred in the absence of revenue growth—and because some services and production were shifted to cheaper labor sources as technology-driven globalization and its inherently competitive forces increased “offshoring.”

Unlike the revenue-squeezed national economy during the recent “bubble” years, higher education today can increase revenues by increasing capacity to meet the national enrollment growth projected for the remainder of this decade and beyond. So higher education is in a cycle in which enrollment growth can potentially offset any downsizing made possible by technology-enabled productivity increases. In parallel with the example of the national services economy and in the context of the increasing demand inherent in demographic trends and life-long learning markets, nonprofit higher education can respond to today’s pressing accountability obligations with technology-enabled innovations. Colleges and universities can use the common course and flex program and service redesign strategies to redesign service processes for higher productivity (lower unit costs) and overall improvements in academic results, including the capacity for, and the affordability of, access.

To do so, however, an interested institution will first have to embrace IT-enabled innovation as a necessary strategy—the only viable strategy available to most institutions—for reducing unit expenses while simultaneously meeting and accounting for other performance obligations relevant to institutional mission. The strategy of simultaneity requires an institutional culture of innovation that 1) replaces unsubstantiated proxies for quality—proxies such as a low student/instructor ratio—with evidence of quality, and 2) embraces the simultaneous pursuit of measurable improvements in academic results and efficiencies in their unit costs. Such a culture requires counterintuitive or even unnatural academic leadership, and, without the cover of a national group such as the NCAHE, only a few higher education leaders have individually called for innovation as a means to improve institutional performance—a phrase henceforth used to parse (the NCAHE’s) “accountability” more finely through a productivity-sensitive framework for measuring educational effectiveness and related unit costs in higher education.

Larry R Faulkner, President of the University of Texas at Austin, is one of the few. He gave the Atwell Lecture to the 87th Annual Meeting of the American Council on Education, which was convened to consider the changing “social compact between higher education and the public.” Faulkner urged nonprofit colleges and universities to move from a defensive to a proactive position in responding to the rush of outcome-oriented institutional performance expectations coming from employers and the public and, even more urgently, from the federal, state, and institutional policy-makers who govern, regulate, or help fund higher education and its students.⁸ He noted that,

“At the typical flagship public institution in America, the academic cost of attendance (mandatory tuition and fees) is now in the range of \$5,000 to \$7,500, or about 11 to 17 percent of median family income. Those figures are up from 1 to 5 percent in the 1960s. If the trends of the past 15 to 20 years continue, the share would rise to something like 30 percent of median family income by 2020.”

Connecting price to cost via this access-compromising trend, Faulkner went on to say,

“We must address costs. More specifically, we must mount serious, effective efforts to limit the rate of growth in the educational cost per student. It is in the range of 4.5 percent per year, a substantially inflationary figure, but more important, a figure significantly larger than the long-term growth rate of the economy.”

Faulkner recognizes that innovation, à la the NII report, will be required to reduce unit costs and stabilize prices (tuition) in the interest of access, accountability, and competitiveness. Now gone is the day when the sole indicator of institutional performance was a mission-reflecting combination of student aptitude, faculty credentials, library holdings, anecdotal evidence of an enriched socio-intellectual environment, modernized facilities for teaching and learning, and student/faculty ratios (a lower ratio equated, without evidence, with higher quality learning). The new day requires strategies for identifying, prioritizing, and proactively meeting the critical performance expectations pressuring nonprofit higher education and begging questions about its future.

By not acknowledging and purposefully acting on the role of technology in improving productivity through innovation, most higher education leaders are unknowingly responding to Nicholas Carr’s provocative assertion that “IT doesn’t matter” by tacitly acknowledging that technology has yet to be allowed to matter in higher education.⁹ (IT is a necessary commodity in business which “matters” only if it is applied to competitive advantage—e.g., IT is necessary, but not sufficient, for competitive advantage.) In higher education, IT is evolving into a competitive

⁸ The Changing Relationship between Higher Education and the States, Larry R. Faulkner, 2005 Robert H. Atwell Distinguished Lecture, 87th Annual Meeting of the American Council on Education (Feb. 13, 2005), http://www.utexas.edu/president/speeches/ace_021305.pdf

⁹ IT Doesn’t Matter, Nicholas Carr, Harvard Business Review Vol. 81, No. 5 (May 2003)

necessity and a ubiquitous commodity of considerable expense, but has yet to become an enabler of cost-effective improvements in institutional performance.

Yet, many institutions are now expected to improve and report learning outcomes, manage capacity against demand, provide flexible program and service delivery options, and/or respond in a timely manner to market needs—all while simultaneously reducing or stabilizing unit expenses as a means to stem unsustainable tuition increases. These six expectations are arguably mission obligations that, in some combination and through nuanced emphasis and applicability, can reflect differences in institutional context, mission, and governance—public versus independent. They accordingly are briefly described in Table I on the next page as performance obligations, along with examples of performance indicators applicable to each obligation. Subsets of these and other performance indicators could be used to filter potential strategies and innovation initiatives aimed at meeting institutionally pertinent performance obligations. The indicators, however, are neither inclusive nor universally relevant. Instead, they reflect policy makers' convictions that nonprofit higher education is obliged to monitor, improve, and report performance on an ongoing basis as part of its evolving social compact with the public. Those familiar with the NCAHE report will note that the report's accountability imperatives—less research accountability, which we do not address here—map readily to the six obligations in Table 1.

Table 1

| Institutional Performance Obligation | Attendant Performance Indicators |
|--|--|
| <p>Learning accountability: Account quantitatively for the quality of learning outcomes, where possible through comparative benchmarking across time of</p> <ul style="list-style-type: none"> retention, persistence, and graduation rates (expected versus actual rates) among comparable institutions, and broadly accepted independent learning assessments in the large-enrollment courses commonly taught at almost all comparable institutions. | <ul style="list-style-type: none"> Participation in the Collegiate Learning Assessment, the National Survey of Student Engagement, or the Community College Survey of Student Engagement Independent outcomes assessment of developmental courses, college-level basic skills courses—in math, Spanish, writing, etc.—and the five highest-enrollment introductory-level disciplinary & professional courses Expected rate vs. actual rate for key indicators such as retention, persistence, and graduation |
| <p>Program accountability: Account for any mission obligations to respond rapidly to economic development priorities and workforce/professional education priorities by redesigning or developing academic programs to address these priorities.</p> | <ul style="list-style-type: none"> Percentage of annual student FTE increase directly attributable to programs created or redesigned to meet identified economic development or workforce needs—for teachers, nurses, biotech workers, etc Percentage of annual increase in non-credit enrollments directly attributable to programs created or redesigned to meet identified economic development or workforce needs—for teachers, nurses, biotech workers, etc. Percentage of all degrees awarded that are directly attributable to programs created or redesigned to meet identified economic development or workforce needs—for teachers, nurses, biotech workers, etc. |
| <p>Expense accountability: Account for the direct expense of instruction and other key lines of service—IT services, registrarial services, financial services, and so on—using per-student FTE, per-enrollment, or other appropriate unit measures of direct expenses.</p> | <ul style="list-style-type: none"> Per-enrollment direct instructional expenses and average ratio of enrollments to instructional personnel for development courses, college-level basic skills courses—in math, Spanish, writing, etc.—and the five highest-enrollment introductory disciplinary & professional courses Per-student-FTE central IT expense and IT personnel (full-time & part-time) expense Similar unit expenses metrics in other lines of service Percentage of change in the annual ratio of student FTEs to administrative FTEs |
| <p>Affordability of access: Maintain affordable access to academic programs (within mission responsibilities) by limiting the rate of any annual tuition and fee increases to the Consumer Price Index.</p> | <ul style="list-style-type: none"> Ratio of the annual rate of change in undergraduate tuition/fees to the annual Consumer Price Index Ratio of per-FTE revenues from tuition/fees and subsidies/grants to per FTE direct operational expenses |
| <p>Convenience of access: Provide flexible, integrated access to academic programs and comprehensive support services—flex programs and services—by combining online (asynchronous) self-service course and service options with as-wanted expert help via walk-in service centers and a 24x7x365 call center.</p> | <ul style="list-style-type: none"> Percentage of all degree programs which can be delivered asynchronously except for required clinical or lab work Percentage of all non-credit programs which can be delivered asynchronously except for required clinical or lab work Annual inventory of services accessible asynchronously via a web portal |
| <p>Capacity for access: Adjust institutional capacity after projecting demand for access to pre-requisite and priority courses, academic programs, and other services that are critical to mission fulfillment.</p> | <ul style="list-style-type: none"> Percentage of qualified applicants refused admission or admitted with delay Annual percentage change in total credit hours and in total non-credit enrollments Total first-term enrollments (credit & non-credit) Ratio of total first-term credit hours to total first-term instructional personnel FTEs and of total first-term non-credit enrollments to total first-term instructional personnel FTEs Ratio of total annual enrollments to total seating capacity of the classroom plant |

The analytical and how-to sections of this paper that follow are for higher education leaders willing to embrace and act on the imperative to apply technology innovatively on a systemic initiative-by-initiative basis. They must be willing to improve unit cost structures (expense accountability) while simultaneously improving performance indicators for all mission-pertinent performance obligations among the other five listed in Table 1. Our analysis and how-to advice are generic of necessity, and, thus, lacking the nuance that would differentiate their application from one higher education sector to another. There is, however, a useful differentiation framework that can be revealingly applied in nonprofit higher education to do so.

One of today's most enduring "business-guru" books was authored by Michael Treacy and Fred Wiersema ten years ago.¹⁰ They advise business to "choose your customers, narrow your focus, and dominate your market" and to do so by focusing intensely on exactly one of three possible "value disciplines"—*operational excellence*, *product leadership*, or *customer intimacy*—while meeting threshold standards in the other two to maintain competitive position within the selected market. In nonprofit higher education terms, their advice translates at first glance as "choose your student audiences, narrow your focus to those audiences, and, in each, outperform your mission obligations." Such advice is appropriate for an independent institution that is free to self-determine its "charitable purpose" under the tax code. Public institutions, however, are not completely free to choose their student audiences—their missions and services being subject to public charters and even to changing public laws and expectations. Nevertheless, all nonprofit institutions have considerable latitude in how they fulfill their mission obligations. That latitude is where Treacy's and Wiersema's value discipline enters the picture to help an institution discipline itself to deliver the value that is its mission, whether self-selected or mandated.

For example, most community colleges and non-research public universities should adhere to the value discipline of operational excellence characterized by high productivity and highly satisfactory, but streamlined services that must be provided within a tight publicly subsidized resource allocation. They should consider applying the common course redesign and the flex program and service redesign strategies in combination to 1) improve and report student learning, 2) increase capacity (the faculty's, the staff's, and the physical plant's), and 3) respond to economic development and workforce/professional needs with flex programs—all while reducing unit costs to stabilize tuition and fees.

In contrast, many independent institutions practice the value discipline of customer intimacy—"student intimacy" through an individualized, personal educational experience featuring rich student/faculty interactions. These institutions should consider using the common course redesign strategy to increase student intimacy while reducing its unit cost. Some may also wish to use the flex program and service redesign strategy to offer selected professional or niche programs to convenience markets at profitable tuition rates. (The "national" liberal arts colleges in this group also practice the value discipline of product leadership by marketing the prior achievements of their incoming students and the post-baccalaureate educational and/or lifetime achievements of their graduates.)

Most public and independent research universities practice the value discipline of product leadership by marketing a highly-productive research faculty and national/global brand recognition owing to some combination of incoming student quality, alumni achievements, and/or national standing in major sports. They can consider using the common course redesign strategy to improve student intimacy and reduce per-enrollment costs. They can deploy the flex program and service redesign strategy to extend their graduate professional programs and brands beyond traditional markets to new flex markets.

The rush of recommendations and supporting evidence in this executive summary are offered in the spirit of "tough love." The reader may choose not to read further, but we believe that nonprofit higher education will eventually adopt and adapt the advice offered here and detailed in the sections that follow, and will delay action at the expense of relinquishing significant near-term control of its own destiny.

¹⁰ *Discipline of Market Leaders*, Michael Treacy & Fred Wiersema, Perseus Books (New York), 1995, Addison-Wesley (Reading, MA), 1997 edition ; see <http://www.bizsum.com/thediscipline.htm> for a summary review

The Catch-22 Leadership Vise of Revenue/Cost Pressure vs. Performance Obligations

Leaders who would like to embrace and improve institutional performance often report being trapped in a “catch-22” situation. They are being asked by policy makers to improve the academic aspects of institutional performance, a task they believe will require additional expenditures and, therefore, additional revenues. Yet, the same policy makers are asking higher education leaders to hold the line on tuition increases, and are also reducing public funding for higher education relative to other tax-supported needs. Catch 22!!

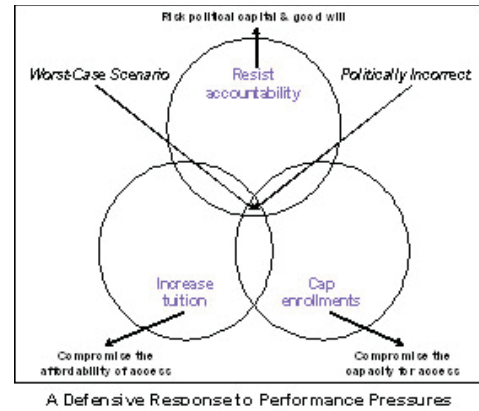
The catch-22 reaction is only heightened by a broader revenue/cost pressure that is being increased simultaneously with the pressure to improve institutional academic performance—the full squeeze of the opposing pressures of the catch-22 leadership vise. Over 200 citations are offered in Table 2 (in the Appendix) as evidence that the evolving social compact with the public calls for higher education to practice the kind of innovation described in the NII report to have productivity as one of its primary goals or byproducts. Each citation in Table 2 is cross-referenced to the six performance obligations in Table 1, as well as to a nationally observable aggregate revenue/cost pressure described below as multiple pressures points, a differentiating subset of which applies to any institution.

- Revenue pressures arising from an increasing flux in traditional revenue sources, such as the
 - declining percentages of state allocations to higher education relative to state allocations to other needs, such as health care, public schools, and incarceration;
 - declining percentages of institutional revenues coming to institutions, directly or through their students, from state and federal subsidies and grant programs;
 - increasing tuition inelasticity resulting from competition from peer and for-profit institutions; and
 - increasing and, for many institutions, risky reliance on gifts, grants, and contracts (relative to public funding).
- Cost pressures, such as
 - funding more and larger need-based grants from internal non-public resources; and
 - escalating (competitive) tuition discounting for less needy, but highly qualified students.

The reason for introducing revenue/cost pressure is to assuage both the potential reaction that this author is unfamiliar with the apparent catch-22 nature of emerging policy expectations and, more importantly, the perception that public policy is being amended on an uninformed catch-22 basis to destroy an ideal, generation-spanning social compact between the public and higher education. The social compact of the last half century, after all, placed little to no emphasis on expense accountability. In contrast, today’s policy makers are aware of the role of technology-enabled innovation in reducing unit costs while increasing competitiveness throughout the services economy, and they are bringing that awareness as an expectation to the evolving social compact with higher education. It is technology—more accurately, technology-enabled competitive innovation as practiced throughout the economy—that takes the catch-22 out of the discussion of the evolving social compact and fairly places expense accountability and the affordability of access in Table 1 among four other institutional performance obligations that are not directly financial in nature—each of which would nevertheless benefit from the wise use of technology. The catch-22 reaction is not surprising, for academic culture tends to conflate total expenses and total revenues—as *the budget*—while too seldom identifying and managing *unit costs*. This tendency obscures the high probability that policy makers expect higher education to innovate internally, both to improve the academic aspects of institutional performance and to reduce unit expenses, the latter in order to stabilize tuition and reduce the need for relative increases in tax-supported revenues. The prevailing academic culture, instead, perceives a catch-22 vise squeezing nonprofit higher education ever more tightly between revenue/cost pressure, on one side of the vise, and, on the other, the pressure to meet institutional performance obligations (in the absence of new incremental per-student resources). Many institutions accordingly are seeking additional per-student direct or indirect public funding while simultaneously capping enrollments (thus reducing the capacity for access) and/or raising tuition (thus eroding the affordability of access). Capping enrollments and raising tuition, however, can readily be perceived externally as a defensive or even arrogant response to the rising expectation for improved institutional performance—a response depicted graphically at the right as a worst-case scenario. Capping enrollments and increasing tuition, moreover, do nothing *à priori* to reduce unit costs and measurably improve academic quality—lower student/instructor ratios and higher tuition not being linked, *à priori*, to measurable improvements in learning. Instead, such actions tend to freeze unit costs and manipulate enrollments and price to make total costs and revenues match—hardly a strategy for improving institutional performance. A more proactive strategy would start by differentiating expense accountability and the affordability of access—as is done in Table 1—in order to

focus attention on price as a function of unit cost, a relationship often overlooked by nonprofit institutions that have never been threatened with closure through cost overruns.

Revenue/cost pressure and the performance obligations for expense accountability and the affordability of access are related phenomena, and the latter two arguably could have been omitted from Table 1 since they intersect any discussion of revenue/cost pressure. But to do so would have removed price and unit cost from a coherent list of ongoing, publicly visible mission performance obligations and tainted them with the perception that they are only externally imposed financial concerns coming from a few misguided policy makers who do not understand the traditional social compact with higher education. Policy makers are calling for price (affordability of access) to be addressed as a function of unit costs (expense accountability) and the two to be addressed *simultaneously* with the subset of the remaining four performance obligations in Table 1 that are relevant to an institution's mission. This external expectation of *simultaneity* was clearly stated internally in the NCAHE report and the cited speech by Faulkner. Is it reasonable?



Improving academic measures of quality while simultaneously reducing unit costs has not been the norm for innovations in higher education over the years. Most institutions have used grants, both internal and external, to seed innovations responsive to some of the four non-financially stated performance obligations in Table 1. Faculty and program development grants, for example, have targeted the improvement of student learning and the timely, market-responsive development of new programs. As ubiquitous access to personal computers, Internet connections, and course management systems was evolving, institutions began to channel such faculty and program development investments into the development of online and hybrid courses, programs, and services. With a few important exceptions (which will soon be portrayed), these investments did not directly seek to reduce long-term unit costs and/or dampen spiraling tuition increases, and, not surprisingly, did not do so, whether they used technology to enable innovation or not. They accordingly did not pass the innovation test of the NII report—increased productivity—but instead either added to long-term operating expenditures or proved unsustainable after the loss of special funding.

There have been exceptions to the norm. For example, technology has been used to accommodate enrollment growth and improve learning while also reducing unit expenses via a strategy that increased not only total revenues, but also the average academic outcome and “profitability” of each new enrollment.¹¹ A few specific examples will illustrate this and other proven strategies.

Examples of Improved Institutional Performance

Some institutions have seeded long-term institutional performance initiatives with successful service redesign projects. Benedictine University, for example, is a nonprofit, independent university facing a range of competitive pressures. It competes in the Chicago area with other institutions (including the for-profit University of Phoenix) to attract students interested in earning an MBA. Benedictine accordingly set a goal to increase its MBA enrollments and their “profitability.” Using technology to redesign courses and services, the university developed a more flexible version of the traditional MBA program; the resulting WebFlex MBA features significantly reduced requirements for real-time student/instructor interaction as well as a host of 24x7x365 support services for students. A second redesign of the program targets students who cannot or will not participate in real-time interactions; this version is fully online and has no synchronous requirements to preclude enrollments from outside the Chicago market. To fill gaps in its internal resources and to improve time-to-market, Benedictine outsources some support services, including help for faculty and staff members in redesigning courses, programs, and other services for flex markets. Employing the program and service flex redesign strategy (described in detail in a later section), Benedictine is meeting evolving enrollment and profitability goals, and it now competes more effectively and efficiently for students in terms of quality, flexibility, and price.

¹¹ See the description of the Rio Salado project on page 35 in *Improving Learning and Reducing Costs: New Models for Online Learning*, Carol A. Twigg, EDUCAUSE Review Vol. 38 No. 5 (Sep./Oct. 2003), 28-38, <http://www.educause.edu/ir/library/pdf/erm0352.pdf> (for evidence that learning outcomes can be enhanced while increasing the instructor/student ratio, thereby potentially accommodating more students).

Successful flex program and service examples at public universities and state systems include UMassOnline, UBOOnline (at the University of Baltimore), and the Tennessee Board of Regents' Online Degree Programs.

Taking a different path than Benedictine, a Fairfield University faculty team in biology has redesigned the two-semester General Biology course, one of the University's largest courses with an annual enrollment of 260 students. The course formerly was taught in a multiple-section model requiring seven faculty FTEs with 35-40 students per section. The redesigned course "consumes" only four faculty FTEs and condenses all sections into a single large-classroom format. Students work in teams of 2-3 around individual laptop computers, utilizing software modules that focus on inquiry-based instruction and independent investigations. Significant cost savings of 31 percent (from \$506 per enrollment to \$350) are being realized by reducing faculty time in three major areas: 1) materials development for lectures; 2) out-of-class course meetings; and 3) in-class lectures and labs. Consolidation of seven lecture sections to two in the redesigned course and the introduction of computer-based modules in the lecture and laboratory have contributed to the reduction in costs made possible by the **common-course redesign strategy**, which will be described in more detail in a later section.

Using a more radical approach to common course redesign than Fairfield, Virginia Tech has developed and been recognized for its innovative Math Emporium. A faculty team from the math department successfully redesigned the department's core linear algebra course by eliminating traditional contact-hour activities in favor of as-needed help to support guided self-study and required problem-solving activities. All of this takes place in an emporium-like, computer-lab study space or online. The redesign ultimately improved the course's learning outcomes while reducing its direct per-enrollment instructional expenses by 77 percent.

The University of Hawaii is an example of a system that has started a system-wide course redesign project, which could yield even greater effectiveness and efficiency than might be achieved by each campus acting independently to redesign common courses.¹²

Ocean County College (OCC) near the New Jersey shore is using both the common-course redesign strategy and the program and service flex redesign strategy. OCC offers a traditional nursing program, and, for a select group of people who already work in the healthcare field and are interested in becoming registered nurses (RNs), it also offers a flex version of the traditional RN program: the One Day per Week Option, requiring only one day per week of site-based learning and clinical experience. The flex program increases the capacity of OCC's existing classroom plant by reducing required contact-hour interactions, and it increases the faculty's capacity to work with more students by redesigning the common (required) courses in the nursing program. Students benefit because they can keep their healthcare jobs while enhancing their professional credentials and opportunities for advancement.

OCC is also redesigning a high-enrollment introductory psychology course (as part of the Roadmap2Redesign initiative) and common courses in developmental math and Western civilization (with support from contracted support resources). All three courses will have reduced contact hours and, in the long term, should lead to the advantages cited above: increased enrollment capacity, more flexible options for students, and reduced per-enrollment instructional expenses.

Mohave Community College in Arizona has improved the performance of its central IT services through outsourcing and developed an information infrastructure that unifies and corrects formerly disparate and sometimes replicated data. Mohave has further developed an analytics infrastructure for accessing and analyzing that data to gain knowledge of institutional performance issues and inform decision making. Mohave is also participating in the aforementioned Roadmap2Redesign project to redesign a large-enrollment course to reduce instructional costs while measurably improving learning outcomes.

High Performance IT: Necessary for Innovation but Not Sufficient

Well managed technology infrastructure and support has become a competitive necessity in the national economy, not as a competitive differentiator, but as a tool to redesign service and production processes as the basis for competitive innovations that can improve quality, unit cost structures, market reach, and customer convenience and satisfaction. Today's banking services, for example, rely on a high-performance IT infrastructure and related technical and business support for customers. Banking services are based on a customer-centric and cost-effective flex services model that combines convenient, online self-service with alternative access options for securing expert help when customers need or want it. Automated teller machines are the most familiar form of self-service, but online (asynchronous) banking (from any Web connection) can provide self-service at its most convenient by

¹² The University of Hawaii Launches Strategic Initiative, The Learning MarketSpace (Jul. 2004), published online by the National Center for Academic Transformation, <http://www.center.rpi.edu/LForum/LM/July04.html>

allowing customers to manage their accounts, set up automatic deposits and payments, apply for loans, and so on. Most banks also provide toll-free or online access to customer-service representatives during extended hours or even 24x7x365. And face-to-face help is available during business hours in convenient branch locations and the main office.

Bankers don't market "distance banking" or label customers as "traditional" or "nontraditional." They realize that different customers have different needs and preferences for how they obtain services. Banks also know that time-shifted online self-service can reduce costs while increasing customer satisfaction, which is why they frequently offer incentives for self-service. They outsource and merge or partner with each other to lower unit costs and enlarge the customer base to a level commensurate with ever-growing competitive pressures on profit margins. An investment in high-performance IT doesn't guarantee success, but it does give banks an opportunity to innovate cost-effectively in order to retain customers and compete more effectively for new customers. Some banks will succeed in this increasingly competitive environment; some will not. Success will depend, for example, on other applications of technology to help cost effectively track and manage the customer relationship and to gather evidence ("business intelligence") about customer needs and the effectiveness and internal costs of services. Competitive outcomes will depend on how well redesign efforts and resulting service innovations are executed to offer new services, improve service quality, retain customers, and reach new markets—all while reducing unit service costs.

Our earlier observations about the role of IT in making it possible for the national economy to register notable productivity gains through the recent economic downturn, along with some technology-enabled examples of cost-effective innovations in higher education, spoke to the necessary role of a high-performance IT environment in any attempt to reduce unit costs while simultaneously improving other indicators of institutional performance. Just as in the banking industry, however, high-performance IT is necessary, but not sufficient, for planning and implementing cost-effective, competitively successful service innovations aimed at improving institutional performance in higher education. Technology has become not only ubiquitous in higher education, but also a worrisome expense for many leaders precisely because it has largely remained a necessary expense in response to grass-roots demands for "digital-campus" services that only randomly or episodically coincide with innovations purposefully selected and supported to improve quality and access, while also reducing unit costs.

Meanwhile, IT expenditures have moved beyond baseline *technology infrastructure* to encompass an *information infrastructure* in which institutional data have been unified and integrated across a number of different systems—student information system, financial system, human resources system, course management system, and a variety of systems representing various vertical lines of service at the institutional and departmental level. The individually customizable, self-service portal is the visible metaphor for the emerging information infrastructure. Reliable self-service access to integrated data, however, does not, in its own right, provide the knowledge required to plan and manage the future using available data about the past, present, and various institutional constituencies. Increasingly powerful analytical software tools will power a next transition phase toward an *analytics infrastructure*, which will provide the technical and analytical foundation for selecting and investing in the kind of innovations discussed in the NII report—those that are designed to improve institutional performance in a way that reduces unit costs. This last phase might be called "**innovation infrastructure**" in recognition of the NII's vision. In all four phases, "infrastructure" is used to connote more than technical infrastructure—e.g., to connote also mission-appropriate governance, planning, and resource allocation models to support the identification and tracking of institutional performance priorities and the allocation of IT and other resources to them.

A surprising number of colleges and universities, however, continue to struggle with baseline technology infrastructure and information infrastructure. Whether internally or externally (outsourced) staffed, operated, and managed, a high-performance baseline technology infrastructure supporting an information infrastructure is characterized by:

- high levels of user satisfaction, and
- competitive per-student-FTE (or per-student) IT expense at a predictable annual level to cover:
 - ubiquitous access to the campus network and the Internet;
 - baseline network and server-based (back-office) systems, such as the administrative system, the course management system, security systems, back-up and disaster-recovery systems, and the campus network with its connection to the Internet;
 - hands-on technical support and training, as required, for centrally supported desktop, lab, and classroom technologies and for the applications of the above systems;

- technical systems integration services to implement and manage an individually-customizable self-service web portal providing single-logon access to a unified set of application services based on the above systems—the basics of a reliable, accurate, and easily accessible information infrastructure;
- 24x7x365 monitoring for all the above systems;
- 24x7x365 technical help desk for all students and faculty/staff members; and
- assessment, planning, selection, conversion, and upgrade processes for all the above systems, managed within budget and to meet planned schedules.

Overcoming the Barriers to Using IT as Leverage for Improving Institutional Performance

There are two necessary conditions for using technology to improve institutional performance. The first is the effectiveness of the central IT organization in support of planning, implementing, and managing a high-performance baseline technology infrastructure that has expanded, or is expanding, to support an information infrastructure. The second necessity is institutional leadership committed to supporting IT and including the IT organization in an institutional transition toward an innovation infrastructure. This process must permit and require academic and administrative units to work together daily in real time in order to a) identify mission-critical performance obligations and related indicators for measuring improvement objectives, b) assign academic and administrative “owners” to the selected performance objectives, and c) fund and support service process redesign strategies and innovation projects designed to meet the selected objectives. While most executive and IT leaders understand this to mean that the IT strategic plan must align with the institutional strategic plan, John Voloudakis argues that more is needed—specifically, a **blended, adaptive planning model** to achieve focus and nimbleness on a continuous initiative-by-initiative basis.¹³

First, however, the president or chancellor must ensure that the IT organization itself is not a barrier to progress, exhibiting weaknesses such as:

- Dysfunctional human resources
 - Weak internal management
 - Weak service mentality
 - Staff recruiting and retention difficulties
 - Weak leadership—inability to work collaboratively with academic and administrative units to accomplish tactical goals and to plan for and support the human and organizational aspects of an innovation infrastructure and culture
- Inadequate resources for IT and IT projects, whether an issue within the IT organization or an issue of institutional resource allocation
 - Inadequate IT infrastructure
 - Inadequate support services and coverage (24x7x365)
 - Capacity and/or expertise for system planning, selection, conversion, and upgrade for key systems
 - Capacity and/or expertise for services/systems integration—web, portal, and other projects in support of creating an analytics infrastructure and an innovation infrastructure and culture
- Unpredictable or unsustainable IT costs
- No economies of scale from outsourcing or from being part of a system, district, or consortium

¹³ Hitting a Moving Target: IT Strategy in a Real-Time World, John Voloudakis, EDUCAUSE Review vol. 40, no. 2 (Mar./Apr. 2005), 44-55, <http://www.educause.edu/ir/library/pdf/erm0522.pdf>

The graphic to the right summarizes the technical and organizational infrastructure associated with the transformation from baseline technology infrastructure support to support for the kind of innovations enabled by collaborative, blended, adaptive planning and cultural models focused on improving institutional performance.

If modest adjustments to current IT practices and the relationship of the IT organization to other units have proven futile, then more systemic changes to the current IT staff and organization, its per-student-FTE funding, and/or its practices should be pursued. According to a recent study by the EDUCAUSE Center for Applied Research:

“As needs arise, institutions should consider the broadest range of sourcing options, including collaboration with other institutions, ERP or other software, outsourcing, and open source technologies. Both one-time and ongoing support costs and benefits should be considered.”

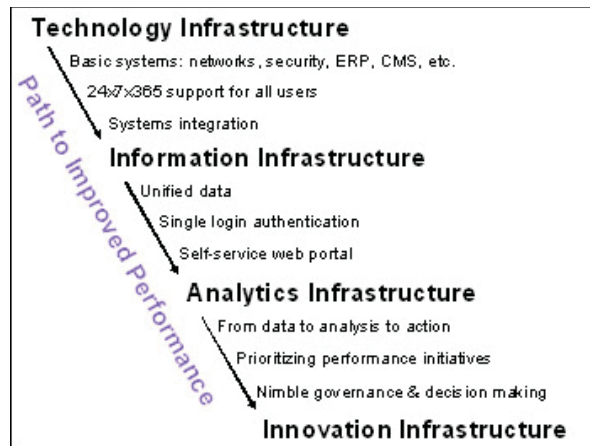
“IT organizations will not be able to achieve more stable, flexible funding by seeking additional budget dollars alone, and flexibility and agility will not come entirely from cost cuts. The CIO must lead efforts to rethink personnel strategies, sourcing strategies, process improvements, and project prioritization in order to ensure that the climate encourages IT innovation and provides maximum IT value to the institution.”¹⁴

A high-performance IT organization is necessary but not sufficient for improving institutional performance. Executive and faculty leaders outside the IT organization must lead the non-technical effort to develop an analytics infrastructure and then an innovation infrastructure and culture that can identify and embrace initiative after initiative aimed at improving institutional performance over the long term.

Leadership barriers are usually more cultural than tactical. The prevailing shared-governance culture of higher education can easily collide with the culture of evidence required to identify, track, and report performance obligations, especially as they relate to the outcomes and expenses of instruction and other academic services. Agreeing internally on mission-appropriate formulations of institutional performance standards and metrics can be difficult in the presence of the following weaknesses:

- Faculty and executive leadership not collaboratively aligned to meet performance obligations
- Limited experience with or resistance to the service redesign strategies that can improve academic and service performance—including IT service performance—while reducing unit costs
- Strategic plan or a planning methodology that lacks institutional performance indicators and goals to guide daily work, track progress, and revise goals/indicators based on evidence or changing priorities
- Exclusion of the CIO from the cabinet
- Dysfunctional relationships within a cabinet that includes the CIO

Creative leadership is required to correct any such institutional weaknesses and lead the process to establish a culture of innovation.



¹⁴ See page 7 of Key Findings: Information Technology Funding in Higher Education, Philip J. Goldstein and Judith Borreson Caruso, EDUCAUSE Center for Applied Research (Nov. 2004), http://www.educause.edu/ir/library/pdf/ecar_so/ers/ERS0407/ekf0407.pdf

Leadership Creativity

In higher education, the creative lead and manage the creative. Higher education's executives, like their faculty colleagues, often have demonstrated their creativity through scholarship and research in a disciplinary or professional academic specialization. They adapt naturally as leaders and managers to the tenure-based institutional management model designed to catalyze the creative, unfettered pursuit of knowledge development and dissemination and protect it from external political and ideological forces. Unnatural leadership, however, is the expectation today. If traditional academic creativity is not to become its own worst enemy, higher education executives will have to lead and manage in ways that are sometimes counterintuitive in a culture based on shared governance and tenure-based academic freedom. They will have to help the faculty channel some of its creativity into solving today's pressing institutional performance challenges. How creatively disruptive will higher education leaders have to be if technology is to be applied innovatively to instruction, academic programs, and various support services to improve institutional performance?

Will higher education leaders have to dismantle tenure? No, but they should invoke academic freedom only to defend what it was intended to defend: the politically and ideologically unfettered pursuit of knowledge creation and dissemination within the professor's scholarly and instructional obligations to the institution and the discipline/profession. Academic freedom should not be invoked, for example, as a reason for rejecting opportunities to make instruction more effective (as measured by learning outcomes that can be publicly reported) and efficient (as measured by direct instructional expenses that can be reported). Nor should academic freedom be allowed to hinder an institution's migration to more flexible program delivery models giving students the same kind of options enjoyed by customers of other service organizations, such as banks—e.g., a) fewer requirements for real-time interactions in any medium (classroom, office, interactive video, internet); b) a portal-accessible array of customizable online self-service options for matriculating, registering, studying, interacting with teachers and other students, accessing records, paying bills, and so on; c) 24x7x365, toll-free, first-line support services; and d) in-depth expert academic and staff help provided as-needed and as conveniently as possible during business hours by phone, chat session, or in main- or branch-campus centers.

Will higher education leaders have to become technology experts and innovators? No, but they have to ensure that technology is a) well managed and cost-effectively supported by an internal or outsourced central technology unit, and b) innovatively applied, with expert help, to redesign academic and administrative programs and services to improve institutional performance indicators.

Will higher education leaders have to turn their backs on general education and its tenure-protected goals of critical thinking, open discourse, reasoned debate, and learning to learn? No; the technology-enabled common course redesign strategy described in the next section is a proven strategy for using technology to improve and account for student learning outcomes while simultaneously reducing the direct costs of instruction in high-enrollment general education courses.

Will higher education leaders have to become relentless cost cutters in response to unrelenting pressure on traditional public and private sources of revenue? No, but they will have to differentiate key unit costs—such as costs per credit, costs per graduate, and so on—from aggregate revenues and learn to use technology to redesign services to improve their quality, capacity, and flexibility while simultaneously driving down their unit costs.

In its use of technology, higher education has creatively moved from supporting random acts of progress (serendipitous grass-roots successes) to supporting pockets of progress, such as the examples cited above and the increasing attempts to implement portal technology to integrate customizable self-service around a number of academic and administrative service functions. The time is right to align executive and academic creativity to move toward systemic progress on improving institutional performance in the public interest. Higher education boards, executives, and faculties must learn to work together to create differentiated academic management and governance models selectively designed to fit each of the diverse mission planks and public-interest obligations of their institutions. Only then will the coupling of academic creativity and freedom at the heart of academic culture not become its own worst enemy, but instead serve the public interest it was designed to serve—in an accountability-based social compact of mutual trust and support.

Innovation Strategies for Using IT as Leverage for Improving Institutional Performance

Academic leaders dedicated to using technology to improve institutional performance first must identify priority performance indicators, establish their tracking and improvement as an institutional priority, and support and oversee the management of a high-performance IT organization that is collaborating daily with other units in support of an innovation infrastructure and culture. Then they must use their priority performance indicators to select and support redesign strategies and initiatives that can directly affect the indicators. This is the point at which the two aforementioned service process redesign strategies come into play—the a) program and service flex redesign strategy and b) common-course redesign strategy.

As in the Benedictine University, Ocean County College, and banking industry examples, the **program and service flex redesign strategy** is to redesign academic and administrative services and programs to provide options for individual customization while eliminating or relaxing inflexibilities and inconveniences in their delivery. The goals align with the performance obligations for expense accountability, program accountability, convenience of access, and capacity for access, and are more specifically as follows:

- Reduce requirements for real-time interactions between students and faculty/staff by providing:
 - more instruction and other study and service opportunities delivered in online, time-shifted (asynchronous) self-service modality with as much option for individual customization as possible;
 - less contact-hour instruction, regardless of whether faculty/students are in the same classroom or are interacting in real time online or in a tele-video classroom;
 - fewer face-to-face or scheduled non-instructional service transactions; and
 - expert service interactions with the faculty/staff when needed or wanted by the individual.
- Increase students' options for conducting service transactions, scheduling courses, studying, getting expert help, and completing a degree program.
- Increase enrollment capacities.
- Reduce the unit expense of services.
- Reduce dependency on the semester model.

The flex redesign strategy applies to almost all non-instructional services and selectively to academic programs. The customizable, self-service *portal* captures the concept of flex services and promises to integrate administrative and academic services while increasing service access and flexibility. Many colleges and universities have implemented a campus portal, typically after migrating their administrative “back-office” systems—financial, human resources, and student information systems—to the latest technologies to create an information infrastructure. In the systems migration and integration process, some of these campuses redesigned key administrative service processes in order to avoid bolting the new system onto old service processes at additional, ongoing expense. When system migration and redesign are accomplished together, the benefits include the following:

- Better integration of data and services between departments (e.g., the admissions and business offices)
- Administrative staff reductions or an increased administrative capacity to serve more students, either of which means unit expense reductions
- Improved satisfaction among students, alums, instructors, and staff members
- Opportunities for evidence-supported academic decision-making via a next-phase analytics infrastructure (e.g., projected student performance profiles, admission yields, projected net revenues from tuition, per-credit expenses, and so on)

The academic focus of the flex redesign strategy is typically on redesigning entire degree and certificate programs or important course clusters for flex delivery to students who cannot (or prefer not to) participate in curricula that require a significant amount of real-time interaction. Target programs are often those in high demand or those that respond to economic development, professional, or workforce needs—the performance obligation for program accountability in markets demanding convenience of access. Such programs might include business, nursing, teacher training and certification, college preparatory programs, and general-education clusters or programs.

To be successful, the institution must understand the delivery and pricing factors that will allow a selected program to compete in a targeted market, while also balancing these factors with any necessary requirements for real-time student/instructor interactions. Any effort to develop a flex academic program is likely to fail unless it carefully addresses a number of success factors, such as:

- understanding the targeted student audience profile;
- understanding the delivery modes preferred or required by the targeted students;
- assessing the competition and tuition elasticity;
- providing appropriate marketing and recruiting services;
- applying instructional design practices that have proven effective for flex programs;
- providing professional instructional design and course development support for faculty members and instructors; and
- providing all the instructional and administrative flex services required to support flex students and their instructors.

The **common-course redesign strategy**, illustrated by Virginia Tech's Math Emporium and Fairfield's General Biology sequence, is used to improve learning verifiably while also reducing direct instructional expenses for common courses that account for a significant percentage of all enrollments. This innovation strategy therefore addresses the performance obligations of learning accountability and expense accountability and can also address the performance obligations for the capacity for access and the affordability of access.

If you order your institution's courses starting with the highest-enrollment course (counting all course sections) and terminate your list after cumulative enrollments account for 40-50 percent of total institutional enrollments, you will make two striking discoveries. First, you will notice that there are only 20-30 courses on your list, despite a rather expansive course catalogue of hundreds of course listings. Second, you will notice that almost all of the courses on your short list are taught at almost all other institutions around essentially the same subject matter. These **common courses** include developmental and basic skills courses, required introductory courses from the general education program and a few high-demand degree programs, and high-demand general education electives.

The significance of common courses lies not only in their contribution to institutional expenses, but also in their impact on retention and graduation rates. Their significance justifies using the redesign strategies pioneered by the Center for Academic Transformation (now the National Center for Academic Transformation) through its Program in Course Redesign. With funding from the Pew Charitable Trusts, the Center awarded and supported grants to 30 institutions as each redesigned one general education course. The results demonstrate that such courses can be redesigned to improve and account for student learning while simultaneously reducing per-enrollment *direct* instructional expenses "by about 40 percent on average, with a range of 20 percent to 84 percent," according to Center director Carol Twigg.¹⁵

To model the institutional expense-reduction potential of common course redesign, assume that

- The common courses accounting for 40-50 percent of all enrollments are systematically redesigned over a period of years.
- The average savings in direct instructional expenses is 40 percent (as reported above).
- Direct instructional expenses account for at least 50 percent of all operating expenses—adjust the percentage to reflect your institution.

Taking the product of the three default percentages assumed above reveals that the common-course redesign strategy could save 8-10 percent of the overall institutional expense budget—while also measurably improving learning outcomes! Of course, instructional expenses necessarily vary across both disciplines/professions and level of study—undergraduate to graduate. Nevertheless, common courses often fall short in their outcomes, and the course redesign strategy is an opportunity to improve both their academic outcomes and unit-cost structure in a way that significantly reduces institutional expenses.

How are these performance improvements accomplished? While there is no one-size-fits-all model for common-course redesign, the National Center for Academic Transformation has aggregated various practices into five basic

¹⁵ See the discussion of average cost savings on page 30 of *Improving Learning and Reducing Costs: New Models for Online Learning*, Carol A. Twigg, EDUCAUSE Review Vol. 38 No. 5 (Sep./Oct. 2003), 28-38, <http://www.educause.edu/ir/library/pdf/erm0352.pdf>

models.¹⁶ The common denominator is a collaborative effort by a faculty and administrative services team on each course to:

- Ensure the academic quality and integrity of the effort.
- Plan the redesign, pilot a redesigned section or two, and then implement the successful redesign across *all* sections of the course.
- Learn from the growing body of experience in course redesign when planning and piloting the redesign—for example, by:
 - focusing on the course, not its course sections;
 - emphasizing active and collaborative (social) learning and mastery feedback assessments;
 - assigning learningware and other digital materials for self-study—to supplement or replace traditional text materials;
 - customizing to students' unique needs, to the extent possible, guided study and assistance from faculty members and instructional assistants;
 - documenting differences in course learning through before-and-after or in-parallel comparative assessments;
 - using common assessments—perhaps externally prepared and graded—and other quality-assurance strategies, as appropriate; and
 - realigning faculty tasks without increasing faculty labor.

Faculty tasks often are realigned by applying strategies that, *à posteriori*, happen to increase the student/instructor ratio and, thereby, reduce per-enrollment direct instructional expenses. Such strategies include the following:

- Offload course management functions to a course management system.
- Employ testing software to deliver and grade practice quizzes and required exams.
- Institute team-teaching, in which instructors "divide and conquer" the syllabus instead of taking individual responsibility for the entire syllabus.
- Use lower-paid course assistants for functions that do not require faculty expertise or experience.
- Focus faculty expertise on motivational and integrative activities, difficult subject matter, and interactions with those students who require or desire faculty assistance.

Common-course redesign and flex program and service redesign are not mutually exclusive strategies. For example, enrollment capacity can be significantly increased by applying both strategies to the cluster of the 20-30 highest enrollment courses to increase faculty capacity through course redesign and classroom capacity through flex redesign. Common-course redesign focuses on quality and costs, while flex program and service redesign focuses on flexibility/convenience and costs. Together the two strategies when applied to courses, programs, and other services can improve quality (outcomes), increase capacity and delivery flexibility for the student, and reduce unit expenses—surely a holistic trinity of institutional performance obligations.

¹⁶ Ibid, pages 30-38

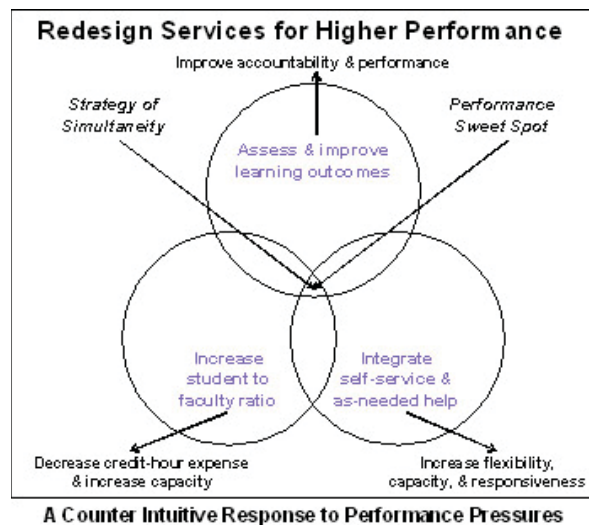
Conclusion

As a ubiquitous, commoditized asset and competitive necessity, IT is here to stay at every nonprofit college and university and should be expertly managed and collaboratively, but determinedly *applied* to improve institutional performance. IT makes it possible, and selectively desirable, to turn the traditional higher education paradigm upside down by bringing the resources of a college or university to the learner rather than, of necessity, bringing the learner to the campus or its physical extensions for access to those resources. Determining when to apply such flex services and whether/when/how to displace their traditional counterparts are institution-by-institution value discipline issues (à la Treacy and Wiersema). The discipline demanded by an institution's value discipline may appear to (and be allowed to) collide with mission values and academic culture—the values traditionally associated with tenure and its byproduct practices such as shared governance, learning community, collaboration, and collegiality. Open, but disciplined leadership can anticipate and avoid such collisions by establishing a culture of innovation that values measurable, affordable performance improvements over unsubstantiated proxies for performance or unrealistically expensive plans to improve performance. Leaders would do well to follow the lead of students who know that technology is a difference that *can* make a difference.

Indeed, a recent study from the EDUCAUSE Center for Applied Research confirmed a common belief about “millennial” students (aka “digital natives”): they expect a ubiquitous IT environment and heavily use technology in their studies and everyday student experiences for reasons of convenience and immediacy (time savings).¹⁷ They attributed improved learning, however, only to the “good use of technology in the classroom,” and few reported good uses in their classrooms—a compelling reason for adopting and adapting the common course redesign strategy for measurably improving learning outcomes (even in courses that are not common courses).

Students also notice that academic and administrative services too often retain the substance of their traditional process requirements after “bolting on” new technologies to effect service improvements. The institutional result, moreover, is an increased expense structure seldom justified by the resulting lowest-common-denominator service improvements that emerge when different service units are allowed to block services unification by insisting on “doing things the way we’ve always done them.”

Rethinking the technology bolt-on process is the essence of using technology-enabled innovation to redesign a service process—e.g., to change the service process in substantive ways to improve its quality, flexibility, and unit cost structure. The time is right for higher education to embrace the opportunities of the Internet revolution systematically by responding to performance obligations and their challenges with strategies that are counter-intuitive to the tradition-bound strategies portrayed from an external perspective as “defensive” in this paper's first graphic (A Defensive Response to Performance Pressures). The two redesign strategies described in the previous section, when combined mission-appropriately and simultaneously over time, can lead from both an internal and external perspective to the proverbial win-win. For example, applying the common-course redesign strategy to any course can measurably improve learning outcomes while simultaneously, in the case of a common course, reducing per-enrollment direct instructional expenses (typically through à posteriori increases in the student/faculty ratio). Services and programs, including the general education program cluster of common courses, can also be redesigned for reasons of flexibility, convenience, and capacity to rely less on required synchronous interactions and more on online self-service and 24x7x365 online and call-in support complemented by interactions with the expert faculty/staff when assistance is required or desired during the normal working day. It is the ongoing *simultaneous* and *purposefully determined* application of these redesign strategies that can lead to the high-performance result depicted in the graphic at the right.



¹⁷ ECAR Study of Students and Information Technology, 2004: Convenience, Connection, and Control. Robert B. Kivvik, Judith B. Caruso, and Glenda Morgan, EDUCAUSE Center for Applied Research (2004), purchasable at <http://www.educause.edu/LibraryDetailPage/666?Redirect=True&ID=ERS0405>, key findings publicly available at http://www.educause.edu/ir/library/pdf/ear_s04/ers0405/Ek0405.pdf

An institution's mission priorities (its value discipline) should drive its efforts to fund and manage IT in support of innovation. Institutions willing to act on these principles are using technology to lay the innovation infrastructure and cultural foundation for becoming high-performance institutions capable of commanding their own futures. Their leaders, both executive and academic, will:

- moderate the randomness of grass-roots, cost-ineffective innovation with the determined discipline to fund cost-effective innovation initiatives of verifiable institutional value,
- fund initiatives for their potential to advance stated strategic, performance objectives,
- monitor those initiatives using quantitative institutional performance indicators, and
- ensure that sure those indicators are embraced externally by policy and oversight bodies.

They will succeed, however, only by monitoring and reporting their results against the expectations and metrics of the society and constituencies they serve—an inexorable shift in the social compact between the public and higher education.

Appendix: Recent References to Performance Obligations and Revenue/Cost Pressure

To illustrate the relevance and timeliness of the six institutional performance obligations in Table 1, the matrix below cross-indexes them (as “relevance” columns numbered 1-6 in the matrix) to a list of websites, reports, books, papers, and news articles (as rows in the matrix). The references are also indexed by their direct relevance to the revenue/cost pressure facing many nonprofit colleges and universities (represented by the last column in the matrix). The intent is not to recommend an impossibly long reading list, but to provide verifiable evidence, in addition to the footnotes embedded in the body of the article, that improving institutional performance is arguably higher education’s most pressing issue, one that cannot be responsively addressed without using technology to contain or reduce unit costs while measurably improving the targeted performance indicator(s).

Table 2

| 1. Learning Accountability 2. Program Accountability 3. Expense Accountability 4. Affordability of Access 5. Convenience of Access 6. Capacity for Access 7. Revenue/Cost Pressure | REFERENCE RELEVANCE | | | | | | |
|---|---------------------|---|---|---|---|---|---|
| | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| REFERENCES | | | | | | | |
| National & State Reports and Web Resources | | | | | | | |
| Accountability for Better Results: A National Imperative for Higher Education, final report from the National Commission on Accountability in Higher Education (March 2005), State Higher Education Executive Officers, http://www.sheeo.org/account/accountability.pdf | x | x | x | x | | | |
| Facing Up and Moving Forward: Mobilizing a National Policy Capacity to Address Student Learning in Higher Education, Conference Report, Wingspread Conference Center, Business-Higher Education Forum, October 6-7, 2004 | x | | | | | | |
| A Matter of Degrees: Improving Graduation Rates in Four-Year Colleges and Universities, Kevin Carey, Education Trust (May 2004), http://www2.edtrust.org/NR/rdonlyres/11B4283F-104E-4511-B0CA-1D3023231157/0/highered.pdf | x | | | | | | |
| National Postsecondary Education Cooperative. How Does Technology Affect Access in Postsecondary Education? What Do We Really Know? (NPEC 2004–831), prepared by Ronald A. Phipps for the National Postsecondary Education Cooperative Working Group on Access-Technology. Washington, DC (2004), | x | | | x | x | x | |
| Measuring Up 2004: The National Report Card on Higher Education - Sept. 15, 2004, http://measuringup.highereducation.org/nationalpdfs/presentations.cfm , National Center for Public Policy and Higher Education, http://www.highereducation.org | x | x | | x | | x | |
| Losing Ground: A National Status Report on the Affordability of American Higher Education, http://www.highereducation.org/reports/losing_ground/ar.shtml , National Center for Public Policy and Higher Education (2004), http://www.highereducation.org | | | | x | | | x |
| Student Engagement: Pathways to Student Success, The National Survey of Student Engagement 2004 Annual Report, http://www.indiana.edu/~nsse/html/report-2004.shtml | x | | | | | | |
| Engagement by Design, Community College Survey of Student Engagement 2004 Annual Report, http://www.ccsse.org | x | | | | | | |
| Public Accountability for Student Learning in Higher Education, Business-Higher Education Forum (2004), http://www.bhef.com/publications/public.cfm | x | | | | | | |
| An Assessment Framework for the Community College, League for Innovation in the Community College (August, 2004), http://www.league.org/publication/whitepapers/0804.html | x | x | x | | x | | |
| Higher Education Survey on Leadership, Innovation, and Technology, 2004, Eric Bassett et al, Eduventures, www.eduventures.com | x | x | x | | x | | |
| The National Forum on College-Level Learning, http://collelevellearning.org | x | | | | | | |
| National Center for Academic Transformation, www.center.rpi.edu | x | | x | | x | | |
| Alliance for Higher Education Competitiveness, http://www.a-hec.org | x | x | x | x | x | x | x |
| EDUCAUSE Core Data Services: 2003 Summary Report, EDUCAUSE, http://www.educause.edu/apps/coredata/index.asp | | | x | | | | |
| INFORMATION TECHNOLOGY BENCHMARKS: A Practical Guide for College and University Presidents, David Smullen & Karen Leach, http://www.cic.org/publications/books_reports/index.asp | | | x | | | | |

| 1. Learning Accountability 2. Program Accountability 3. Expense Accountability 4. Affordability of Access 5. Convenience of Access 6. Capacity for Access 7. Revenue/Cost Pressure | REFERENCE RELEVANCE | | | | | | |
|--|---------------------|---|---|---|---|---|---|
| REFERENCES | 1 | 2 | 3 | 4 | 5 | 6 | 7 |
| Entering the Mainstream: The Quality and Extent of Online Education in the United States, 2003 and 2004, http://www.sloan-c.org/resources/survey.asp , The Sloan Consortium, http://www.sloan-c.org/index.asp | | x | | x | x | x | |
| Sizing the Opportunity: The Quality and Extent of Online Education in the United States, 2002 and 2003, http://www.sloan-c.org/publications/books/survey.asp , The Sloan Consortium, http://www.sloan-c.org/index.asp | | x | | x | x | x | |
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About the Author



Dr. William H. Graves is senior vice president for academic strategy for SunGard Higher Education. He is also professor emeritus of mathematics at the University of North Carolina at Chapel Hill (UNC). Bill earned a mathematics Ph.D. from Indiana University before joining the faculty at UNC, where he also served as dean for general education, interim academic officer, senior information technology officer, and founder and director of the Institute for Academic Technology, a UNC/IBM alliance. He took leave from UNC in 1997 to found the nonprofit Collegis Research Institute (with support from Collegis, Inc.). In 1999 he retired from UNC to found and chair the board of Eduprise, an academic technology services firm that subsequently merged with Collegis. The resulting company was renamed SunGard Collegis after being acquired in 2004 to become a subsidiary of SunGard Data Systems Inc. SunGard Collegis provides product-agnostic technology management services solely to colleges and universities to improve the performance of their IT organizations and systems. The company also provides executive consulting and academic support services to help client institutions measurably improve institutional performance by using technology to redesign academic and administrative services.

During three decades as a professor and administrator at UNC and for several years now as a corporate executive, Graves has advocated for and pioneered the role of technology in systemically and measurably improving institutional performance in higher education. He has given hundreds of invited presentations at conferences and on campuses, advised hundreds of institutions, and published over 70 articles and books on the academic applications of IT (in addition to his mathematical research publications). He served on the boards of the IMS Global Learning Consortium, EDUCAUSE, and CAUSE, and is on the boards of the National Center for Academic Transformation and the Alliance for Higher Education Competitiveness. He helped launch Internet2 and EDUCAUSE's National Learning Infrastructure Initiative (now the Learning Initiative) and chaired its planning committee from 1994-2004.