

Can ICT Do More to Reduce Higher Ed Costs? A Return on Investment Perspective

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The College Board recently reported that higher education tuition has increased at twice the rate of inflation for over a decade. Aggregate annual costs of U.S. colleges and universities are nearing \$500 billion. Added to this, the total of student loan debt recently passed the total for all credit card debt, over \$800 billion. Information and Communications Technology (ICT) has been responsible for many significant efficiencies in postsecondary education, but can more be done? Three levels of ICT-related new savings streams are proposed: \$1-2 billion per year (nibbling at the edges), \$5 billion (significant); and \$10-20 billion (major). To attain the savings would require an unprecedented level of sharing among institutions--libraries, space, lectures and much more – but there are many successful examples of these actions already taking place throughout the country. Also, while there is considerable debate about for-profit institutions, they may offer many useful lessons for the non-profits that can help reduce costs and improve quality. The classroom of 2020 may be very different from today's, in structure, methodology and, if some of the proposed approaches take place, could be far less expensive for students while delivering higher levels of quality and service.

Keywords: e-learning, learning management systems (LMSs), cloud computing, lecture capture, informationists, open textbooks, NCAT, for-profit universities, non-profit universities

INTRODUCTION

The United States higher education system is widely envied, but continues to be faced with challenges of significant cost growth. A recent financial summary from the College Board said: “Over the decade from 2000/01 to 2010/11, published tuition and

fees at public four-year colleges and universities increased at an average rate of 5.6% per year beyond the rate of general inflation. This growth rate led the price to increase from 22% of the average tuition and fees at private nonprofit four-year institutions to 28% over the decade” About a third of students pay the full cost and the rest are able to offset some of their costs through grants and loans (The College Board, 2010). Some analytical groups like the Delta Cost Project (Wellman, 2009) have determined that average costs on a per/student basis have actually decreased recently, since Pell Grants and student loans have increased substantially. But in public institutions the contribution from state governments has plummeted, particularly during the past decade (State Higher Education Executive Officers, 2010). The annual costs of postsecondary education will grow to over a half trillion dollars next year (National Center for Education Statistics, 2010) and aggregate debt for education loans recently passed total credit card indebtedness at over \$829 billion. Over a third of that debt has been initiated during the past four years and average student loan indebtedness upon graduation is currently close to \$25,000 (Pilon, 2010).

Information and Communication Technology (ICT) is obviously crucial in all aspects of education and has helped cut costs and increase productivity. It has always had a special niche in reducing unit costs in administrative functions, but from 1993 to 2007 full-time university administrators grew at a rate of 38 percent, more than twice the rate as employees in teaching, research and service (Goldwater Institute, 2010). Can ICT do more? In the following paragraphs close to a dozen approaches are suggested aimed at using ICT more productively in order to help the beleaguered tuition payer. The suggestions cover three levels of potential annual cost reductions: nibbling at the edges (aggregate saving of \$1-2 billion per year), significant (\$5 billion or more) and major (\$10-20 billion). Two caveats: first, there are well over 4,000 colleges and universities in the United States, so the significant savings suggested here would only happen if a large number of them—possibly 25 percent or more--were to take advantage of some of the opportunities. Second, many of the most significant ICT-enabled savings opportunities can only be achieved if many institutions are willing to share in an unprecedented way—across administrative, geographic and programmatic boundaries. I will include examples of institutions that are already leveraging these opportunities with considerable success

NIBBLING AT THE EDGES SAVINGS POSSIBILITIES TOTALING \$1-2 BILLION PER YEAR

LEVERAGING OPEN SOURCE LEARNING MANAGEMENT SYSTEMS

In the first category are four examples, selected from a much larger list. I'll start with Learning Management Systems (LMSs). Many institutions have implemented effective, but expensive, proprietary LMSs systems like Web CT, Blackboard, Gradepoint, Desire 2 Learn, etc. Others are using Open Source systems---like Moodle, Sakai and A Tutor. How much could be saved by moving perhaps a thousand more college LMSs from proprietary to Open Source? A lot. Naïve? Possibly, but there is an even greater payoff if Open Source LMS don't require the university's expensive storage and processing resources. Why not move the LMSs to the cloud? (More on cloud computing below.) Cameron Evans of Microsoft had this comment,

An imaginative state university system could take their Moodle implementations to cloud scale without having to learn any new programming skills. This creates an opportunity for an always-on

learning course-management system without the overhead of datacenter investments. (Evans, 2009)

A recent *Educause Review* listed the top ten ICT management issues, including LMS, and noted:

The expense of licensing and hosting LMSs has prompted a growing number of CIOs to look for savings strategies by considering alternatives such as "dis-integrating" the learning management system⁷ and moving to more open-source applications and cloud systems for web-based learning. (Ingerman and Yang, 2010)

The cost of switching over to Open Source and/or the cloud —infrastructure modifications, training, resistance from major stakeholders, etc.—should not be minimized or discounted and the additive cost of accessing the cloud must be included in the calculations. But there are many successful Open Source implementations already (Ruth, 2010) and reported savings are considerable even without migration to the cloud.

TAKING ADVANTAGE OF NEW PARADIGMS FOR SHARING FACILITIES AND SERVICES OF LIBRARIES

Next on the list: college libraries. In today's IT world must all academic institutions have their own large physical library structure, complete with full scale reference resources (digital, paper and human). Daniel Greenstein, vice provost for academic planning and programs for the University of California System, commented that difficult economic times have made it necessary for college libraries to explore "dramatic restructuring", outsourcing most of their services and sharing print and digital repositories they can no longer manage. He commented, "There are national discussions about how and to what extent we can begin to collaborate institutionally to share the cost of storing and managing books." (Waggoner, 2010) What if a thousand university libraries began to restructure their aggregate costs—facilities, personnel, advising services—by significantly increased sharing of resources through ICT modalities, and using fewer physical buildings? It would take some serious changing of the library paradigm but overall the cost reductions might be dramatic. As one example, among many, The Johns Hopkins Medical School Library is no longer in a physical space, but all its resources are available to researchers through the web site. The library staff, now called "informationists", is now physically dispersed too, operating at the researchers' sites, not in a library building (Welsh Library, 2010). Granted, this is easier for a medical school, because most of their significant holdings are digitized, but the concept and the approach are definitely important. There is a new collaboration between the libraries of Columbia and Cornell which they describe as "building a transformative, enduring partnership that will see a broad integration of resources, collections, services, and expertise between the two library systems". One of its goals is to "Achieve significant integration of operations, services, collections, and resources within three years, and establish a fiscal and governance framework for managing integration" (2 CUL, 2010). And there are many more to consider. Google Books, while controversial as a business model, is already making hundreds of thousands of texts and magazines more visible and available (Google Books, 2010). Project Gutenberg (Project Gutenberg, 2010) and its affiliates offer free access to over a hundred thousand books for which copyright has expired, another treasure for the on line user, downloadable to PC, iPad, Android, Kindle, etc.

MAJOR SAVINGS FROM BROADBASED USE OF CLOUD COMPUTING

Returning to cloud computing, it's important to note that one significant reason that so many major companies and local, state, and national government agencies find the business case for the cloud so compelling, is the dramatic cost savings that may be possible. How much can be saved through cloud computing? It depends on many variables, but here is an example. Joseph Tobolski, director of infrastructure R&D for Accenture, cited the 2009 case of a company that was considering purchase of a processing facility with 150 servers. The cost would have been \$4 million for the equipment plus \$1 million in annual software license fees, not to mention other expenses like staffing, electricity, etc. The total cost for the same capability from the Amazon cloud was an annual service fee of \$131,000. Shelton Waggoner, Associate Vice Chancellor and CIO at University of California Berkeley, describes the significant storage cost savings possible through cloud computing as being on the order of 90 percent reductions in unit cost of both storage and servers, as long as the volumes are large. Here is an excerpt from his description of the magnitude of the potential savings:

Industry averages show that a single storage admin generally supports SAN-based storage at an average cost of \$2.20 per gigabyte per month. At scale, that same cost can drop to under \$.30 per GB per month fully loaded — and that cost is decreasing every month. In the case of servers, the gains are even more dramatic. A common metric for an efficiently run organization is 140 servers per administrator. At scale, many cloud providers are now reaching ratios of more than 1,000 servers per administrator, or a seven-fold improvement. The key in both situations is that the solution requires scale — scale of design, scale of use, and (reverse) scale of cost per unit (Waggoner, 2010).

An excellent summary of the pros and cons of cloud computing in postsecondary education can be found in two recent articles that are particularly pertinent. First, Professor John Leslie King's careful overview makes it clear that while the cloud is becoming a significant force in ICT, a decision maker must balance it against other historical apparently sure IT winners that did not succeed (King, 2010). With that guidance in mind the reader might next consider a fact-filled, practical and highly scalable case study about cloud implementation at New Jersey Institute of Technology that has been a technical and financial success (Ullman and Haggarty, 2010).

Many universities are considering the cloud, but the inherent security risks and concerns about possible lost or compromised data are holding them back. A solution often proposed is a triage of the potential applications, keeping the crucial ones within the university's own cloud and exporting the rest. Again, security concerns are significant, but every technology decision has elements of risk and tradeoffs and the cloud must be a part of the cost-containment strategy in higher education.

EMBRACING A VARIETY OF OPTIONS FOR SAVINGS ON TEXTBOOKS

There are countless others in the nibbling-at-the-edges category, and here's one more—saving on the costs of books. The annual cost of text books for a full-time student, can reach \$1000 including discounts. That cost can be even higher if the student has to buy all new books and can approach 10-15 percent of the tuition fee at a public college, so reducing that expense is a significant saving. Rio Salado College in Arizona reduced its students' book fees by about \$2 million per year through the simple expedient of

asking that all courses of the same type use the same text (Powers, 2008). Granted, it's easier to enforce this at Rio Salado since most of the college's professors are not full-timers, but many U.S. college students are also becoming comfortable with e-texts on Kindle, iPad or similar applications. Amazon is selling close to twice as many Kindle books as paper ("dead tree") ones. A related area is the increasing availability of open textbooks, like "remixable" books from Flat World Knowledge (Flatworld Knowledge, 2010) and the Rice University's Connexions repository which offers "an effective means for educators to create, modify, share, and disseminate open textbooks under the Creative Commons Attribution license download or repurpose course texts, homework, and exercises at low or zero cost." (Baker, Fletcher, Kaur and Emmons, 2010). California's Free Digital Textbook Initiative, carefully screens and approves on-line books for student use worldwide for college courses like physics, linear algebra, biology, chemistry and dozens more (California Learning Research Network, 2010).

And there is the "Liquid Textbook" concept pioneered by Symtext Corporation, which proposes the best of all worlds—lower costs and higher value for students, higher margins for content holders, and elimination of paying for sections of the text that are not used. For educators, comptrollers and most important, for students, the idea is intriguing. Symtext's approach includes concepts like: eliminating the unread chapters tax, professor-aggregated content, "wood pulp is not a business model" and mid-semester adoption (Symtext Corporation, 2010). For those who prefer the campus book store, many of these ideas will not be popular, but if every college student could save \$500 per year in book costs alone the math is easy: total annual savings--\$10 billion per year for 20 million college students. That's not attainable in the near term, of course, but it gives an idea of what might be possible some day.

SIGNIFICANT SAVINGS (TOTALING \$5-10 BILLION PER YEAR)

ADOPTING THE NCAT COURSE REDESIGN MODEL IN THOUSANDS OF INSTITUTIONS

The next potential savings candidates are not new or surprising, but they can make a noticeable dent in college costs. What is unusual from my perspective is that they have been so lightly implemented so far. I'll include two: course redesign and more aggressive leveraging of distance learning opportunities at non-profit institutions. Course redesign is not rocket science—it's simply an approach that reassembles and optimizes a very small number of multi-section, required courses which collectively account for a significant amount of teaching hours--about a third of the total FTE at 4 year institutions and over half at community colleges. For over a decade National Center for Academic Transformation (NCAT) has helped institutions as varied as Ohio State, Fairfield University, Tallahassee Community College, and Virginia Tech to redesign large courses in disciplines as varied as math, statistics, biology, astronomy, psychology, government, Spanish, literature and many more. Each approach is different—some simply change the content, others move much or all the content on line or have a "blended" approach, mixing on line and face-to-face (Miller, 2010). Some are in a lab setting, like the Virginia Tech Emporium. The Emporium has been operating for over a decade in a huge space that was formerly a commercial warehouse. It serves about 5,000 students each semester, offering over a half dozen beginning math and statistics courses, without using "normal" classroom instruction. The Emporium's LMS helps the students complete individual modules at over 500 Apple work stations, available around the clock. When

personal assistance is needed there is usually a course helper or professor available to meet personally with the student (Robinson and Moore, 2006)

The results of dozens of these NCAT–assisted course redesigns have been positive and significant: especially in improved learning outcomes, higher completion percentages, and lower unit costs. Per/student cost savings in the current round of NCAT implementations range from \$30 (Brigham Young, English Composition) to \$48 (Ohio State, Statistics) to \$107 (Tallahassee Community College, English Composition) (The National Center for Academic Transformation, 2010). Unfortunately, relatively few institutions have adopted NCAT’s approach, even for one course. What if half the postsecondary institutions in the country were to apply course redesign to, say, a dozen of their highest-volume courses? A hint of the possible cost reduction would be to assume the lowest per-student savings from the current NCAT round, \$30 per course (the highest is \$107), and project it for a dozen high-volume courses for 10 million students (about half the postsecondary population). The result—over \$3 billion in annual savings plus improved learning outcomes. Obviously, this requires a lot of buy-in from professors, deans and provosts—but the NCAT numbers and their proven methodologies have been out there for a long time. Thousands more adopters are needed.

LESSONS FROM THE FOR-PROFIT INSTITUTIONS
—*WAL-MART UNIVERSITY*

It’s also possible to imagine multi-billion annual savings by taking some valuable lessons from the for-profit university sector, which currently has revenues of about \$16 billion per year, including University of Phoenix’s (UP) \$ 4 billion share. UP has a student population of nearly a half million students, in the same range as the entire University of California or the CUNY system and some of the others for-profits, like Kaplan, equal or exceed \$1 billion in annual revenues. There are many concerns about some of the for-profits’ practices, well summarized by a recent documentary on PBS, (Public Broadcasting System, 2010) and featured in Congressional hearings. But, putting aside the criticisms expressed about recruiting and other practices of some of the for-profits, there are several approaches that the non-profits might borrow to leverage the experience of their more free-wheeling academic colleagues. First, the recent establishment of Wal-Mart University, with a potential base of over 700,000 non-college-educated students for associate and bachelor degrees, would have seemed to be an excellent way for the non-profits to compete with the for-profits. But the winner was American Public University (APU), a large for-profit group, which will be charging tuition considerably higher than that of U.S. community colleges, but apparently offered a cluster of other benefits that were attractive for the world’s largest retailer; for example discounts, recognition of job experience credits, etc. (Parry, 2010a). It should be noted that offering credit for work experience is not unique—it is part of many degree programs, in both for-profit and non-profit programs. Most of APU’s professors are adjuncts, sometimes considered a no-no in many higher education circles. But less than a third of the professors in the United States higher education today are tenure/tenure track currently anyway, down from 70 percent three decades ago (AAUP, 2010). Naturally, to compete effectively for the Wal-Mart business would have required not simply one college, but a consortium of institutions willing to work together. There are precedents for this, like the consortium of community colleges that already offers a 10-course program for the Western Association of Food Chains. The certificate program offers ten self-paced courses that can be taken at over 150 locations in nine states. (Western Association of Food Chains, 2010). How much was at stake for the non-profits in not getting the Wal-Mart contract? Assume that 140,000 students complete the Wal-Mart

program at an average cost of about \$20,000 each for a bachelors degree and \$11,700 for an associate degree, which are Wal-Mart's estimates (Parry, 2010a). That's in the range of \$2 billion dollars, which would pay for a lot of salaries and overhead at participating community colleges, and of course there would be significant support from Wal-Mart as well as Pell Grants and other government grant and loan programs. Perhaps it may not be the sort of student that the non-profit schools seek, but the Wal-Mart plan is directly in line with the current administration's stated goal of having a workforce of 60 million college grads by 2020.

*DIRECT PRICE COMPETITION
BETWEEN FOR-PROFITS AND NON-PROFITS*

Large, non-profit university distance learning programs like University of Maryland's UMUC and University of Massachusetts' UMassOnline are smaller in student population than Phoenix, APU and Kaplan, but through strategic alliances it might be possible for them to compete with the giants, on cost alone. Many for-profits charge considerably more per student, require about one fourth of their budget to be allocated to advertising, and have to set aside a percentage of their income for shareholders or owners. Funds of that magnitude could be powerfully deployed by a non-profit consortium which has no need to set aside funds for stockholders. To give another example of the potential competitive advantage of community colleges, there is the recent case in California where Kaplan University, a large for-profit college, offered to give oversubscribed community college courses at a steep discount. But even with the discount the course cost was \$645 versus the community college fee of \$78 (Moltz, 2010). The numbers should not be surprising. A recent study of community college pricing by the National Association of Community Colleges found that the average tuition to obtain a for-profit Associate degree is roughly six times that of a public community college (Mullin, 2010). That offer was declined—but there must be a price point that would be advantageous to the non-profit system somewhere between those two numbers. And there is another model—Embanet—that has already attracted the attention of schools like Boston University, George Washington University, Northeastern University and University of Southern California. Northeastern and many other universities outsource their on-line MBA program to a private company, Embanet, in return give the company a substantial share of the revenues, in the range of 50 to 85 percent (Parry, 2010b). It certainly isn't traditional but may be a sample of the future. The bottom line here is that for-profit E-Learning is currently grossing \$16 billion and that is rising every year. If the non-profits were to exploit their natural cost advantages, could there be a significant return on investment, assuming that they would share the market space and embrace a revised paradigm?

**MAJOR SAVINGS
(\$10 OR MORE BILLION PER YEAR)**

*RETHINKING THE CONCEPT OF THE UNIVERSITY AS A PLACE
—SOME QUESTIONS*

To reiterate the caveats mentioned earlier, there can be no significant ICT-assisted savings without a paradigm that includes sharing among many institutions of facilities, courses, services, and many other functions that are currently done individually. If this were possible, the largest potential ICT-enabled savings might come from something much more significant than the structural adjustments just described. I refer to a slight

tilting away from the idea of the university as a place. Jonathan Kim, IT education specialist at Dartmouth, has suggested that some of the following characteristics will be essential in future course design: 24/7 (anytime), location-free, consumer-driven, active learning, concrete, new media, interactive learning, group collaboration, and breadth. (Kim, 2010) If he is right, then the idea of the university as bricks-and-mortar could be modified—very gradually—since none of these qualities require a specific physical “space” for education. This change could take place in many ways. For example, there might be a significant reduction in the number of individual, full-scale schools and departments in each region. We are all used to the idea of a separate spatial cluster of economists, geographers, etc. at every institution, but a few decades from now possibly there might be only three or four History departments for each state, but plenty of historians and their students and research colleagues linked together by technology-enabled bonds far more powerful than offices and classrooms. Questions like these could affect the process:

- Are 4000 plus separate college History or Math or English departments, libraries, computer support facilities, registrars, etc. needed or could significant regional consolidations, enabled by ICT innovation, gradually take place?
- If the best lectures for Philosophy 101 are not available at one university can they be “imported” through lecture capture technology from another institution with appropriate remuneration to the exporter?
- Can courses that don’t really require face-to-face classroom lectures from a tenured professor be redesigned to deliver the same body of material on line or at some less tethered location, like Virginia Tech’s Emporium, or the NYU approach (described briefly below)?
- Would most institutions eventually be willing to follow the NCAT course redesign process for about a dozen of the most FTP-intensive courses?

*NEW PARADIGMS LIKE WGU INDIANA
AND INCREASING E-LEARNING QUOTAS*

Obviously these are very controversial questions, but it should be noted that the technology to achieve regional consolidation of disciplines, libraries, lecture capture, security of testing, face-to-face interaction, 24/7 availability of course resources, including lectures, etc. has been available for a long time. And there are plenty of indications that this concept may be evolving, especially at the state level. Recently, the state of Indiana took an unusual step by outsourcing an entire planned new university to the Western Governors University, which has headquarters in Salt Lake City. It’s called WGU Indiana and is completely self supporting, offering courses that are especially attractive to working adults. This unique approach, with initial operating costs supported by Lumina Foundation and the Bill and Melinda Gates Foundation was described by Mitch Daniels, Indiana’s governor, this way,

WGU Indiana will fill the clearest and most challenging gap remaining in our family of higher education opportunities: helping thousands of adult Hoosiers attain the college degrees they've wanted and needed, on a schedule they can manage, at a cost they can afford (Lederman, 2010).

Two years ago Governor Tom Pawlenty of Minnesota wanted to establish a goal of 25 percent of all college courses in the state system being taught by distance learning by 2015, and by 2009 the goal was well on its way to being achieved, with 9.8 percent of all registered course work in E-Learning mode (Minnesota State Colleges and Universities, System Information, 2008).

LECTURE CAPTURE AND A NEW KIND OF BALANCE OF TRADE

It's clear that simply implementing distance learning does not assure automatic cost savings. In fact, the for-profit university's degree is more expensive than the public university's, even though most of the for-profit teaching staff is not tenured and teaches only part time—no benefits, no office, low overhead. But the non-profits have a problem too, in that many of their tenured or tenure track faculty do not personally wish to switch to E-Learning approaches (Sammons and Ruth, 2007; Schell, 2005). If only 30 percent of today's postsecondary instructors are tenure track (AAUP, 2010) and many are reluctant to be E-Learning instructors, then the obvious answer might be a balance of trade approach where the best set of lectures would be the focus of the teaching experience, even if those lectures are not from the parent institution. If I wanted to get three credits for a 24-lecture course in Roman Architecture I might in the future be able to "attend" Yale Professor Diana E.E. Kleiner's on-line seminars (Kleiner, 2010) and eventually have the exams proctored and graded through a financial agreement between my university and Yale. The course is currently free, but not credit-granting, so the exporting institution, Yale in this case, could charge for using the lectures in a for-credit course at a participating institution, where exams, student interaction etc., would be arranged with appropriate institutions.

OPEN COURSES, BLENDED LEARNING, TED AND THE OPEN COURSE CONSORTIUM

It's radical, I know, and many would say that on-line classes miss the class interaction and the chance to ask questions. As described earlier, this has been dealt with in many cases with NCAT paradigm that can include some "blended" learning, either in class or on line. New York University recently made arrangements for ten different courses to have the professors' lectures available for its students on the NYU social network platform, freeing the professors to do more face-to-face instruction-- a very high level of blended learning. The courses are American Literature I, Calculus I, Genomes and Diversity, Introduction to Sociology, The Body: How It Works, Human Genetics, New York City: Social History, Statistics for the Behavioral Sciences, and World Cultures: Ancient Israel (Parry, 2010c).

One size does not fit all It would be foolish to assume that everyone wants to be on line instead of in a classroom or that a person below a certain age will automatically prefer to log on to a lecture instead of actually attending. But there is also a growing number of students that find the convenience of less tethered, technology-enhanced courses vital to their lives and livelihoods. Great Britain's Open University downloads hundreds of thousands of lectures from sites like Apple's iTunes Store and UTube University every week and the TED lectures are becoming a special, sui generis, resource everywhere. Many other institutions, notably MIT and Carnegie Mellon, participate in the Open Course Consortium program, making course syllabi and lectures available at no charge. MIT alone has over 2000 courses, syllabi and lectures available. They are free but offer no academic credit (Open Courseware Consortium, 2010). Regional consolidation of academic departments would be complicated, and extremely

controversial. If it were to happen, though, extensive lecture capture and exporting could become easier and the tenured professor could have wider visibility and significance—beyond the confines of the local classroom

*DIFFERENT APPROACHES TO NEW BUILDINGS
AND CONTINGENT FACULTY*

There are many other issues associated with taking greater advantage of the options offered through wider sharing of ICT interventions. Consider, for example, new construction. A large academic building, the ultimate embodiment of the university as a place, can cost \$70-80 million, even more, and usually contains the same spaces that it has had for centuries—classrooms, faculty offices, auditoriums, meeting rooms, eating spaces, etc. Is it reasonable to expect that professors and students will be using physical classrooms and offices as much in a few years as they do now? What if, say, 250 fewer big academic buildings were built every year? That's in the range of \$20 billion in savings. And maybe those that are built can have far fewer offices for professors (hoteling has been an option for decades and many faculty members, like their students, might prefer untethered communication space) and traded for technology and lecture capture laboratories and studios.

Any long term savings will have to include greater attention to the needs of contingent, adjunct and contract faculty, since, as mentioned, over two-thirds of today's college instructors are in that category. Studies indicate that there is a negative correlation between such important factors as retention and persistence and the percentage of adjunct faculty (Jacoby, 2006). Some of the savings from other sources will need to be channeled into improving the status, remuneration and morale of non-tenured professors. That will help boost student satisfaction too.

CONCLUSION

In conclusion, it may be a bit gauche to keep discussing how much things cost, but colleges and universities have, as described earlier, a long history of cost increases that are double the rate of inflation—so perhaps leveraging more ICT opportunities, coupled with some of the gradual paradigm shifts suggested above, could reverse the trend. Some of the suggestions I have proposed are already starting to happen here and there, but the real savings would come if there were a unified approach—thousands of schools taking even greater advantage of ICT-enabled approaches to cost reduction. It will take a long time. There will be many good arguments throughout some campuses urging institutions to go slow on E-books, cloud computing broad-based adoption of the NCAT approach, etc., and particularly on lecture capture. A recent study found that barely one third of college faculty feel that on line collaboration and virtual learning are essential to the 21st Century classroom, while over two-thirds of IT professionals support the idea (CDW-G, 2010). That is a major disconnect. Many of these challenges are further complicated by the difficulties of copyright protection and countless other problems. But higher education is under increased scrutiny for its sustained annual cost increases.

Would it be reasonable to aim for a cost increase in postsecondary education of, say, only \$10 billion per year starting in 2012? That's the year that the total for colleges and universities will go over a half trillion dollars. That increase would represent about 2 percent per year, roughly equal to the inflation rate-- instead of 4 or 6 percent or more in recent years. (National Center for Education Statistics, 2010). I have suggested a laundry list of ways to achieve that kind of savings, but it would depend on wide adoption around the country. In preparing this article I have also interviewed many very capable and

respected people involved in actually turning the levers of universities' management and most of them have told me that these ideas are nice, but they won't make much difference. They may be right but I find myself reading and rereading the words of Governor Pawlenty on the Daily Show. Not very scientific, but they may be useful for us all to consider.

Do you really think in 20 years somebody's going to put on their backpack, drive a half hour to the University of Minnesota from the suburbs, haul their keister across campus, and sit and listen to some boring person drone on about econ 101 or Spanish 101? (Daily Show, 2010)

In conclusion, to be fair, there is a completely different side of this issue, recently presented by Professors Robert Archibald and David Feldman in their new book, *Why Does College Cost So Much*. They argue that it's unfair to blame administrative bloat, excessive staffs, unwillingness to share programs and facilities, etc. for Higher Ed's problems. Here's a summary of their view:

There are indeed problems in American higher education that can be remedied. Our complex financial aid system is a real barrier to increasing the numbers of college-qualified students who benefit from advanced training. And the financing compact between public universities and the states is badly in need of a rewriting. But the first step on the path of wisdom is to ratchet down the overheated rhetoric of crisis and fix what can be fixed. (Archibald and Feldman, 2010)

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