

# WASTE NOT THE LEARNING PRODUCTIVITY CRISIS

## Proposing an Education Assurance Commons

William H. Graves



If we can learn in the cloud, why is education still the slowest form of learning? ...Anonymous student

## Contents

I.	Purpose.....	1
II.	Summarizing the Learning Productivity Crisis: Drivers and Remedies .....	2
	A. Are the Times a-Changin’ in Education? .....	2
	B. The Brains Race and Its Implications for Leaders and Stewards of Tertiary Education.....	3
	C. Outside-In Question Box 1 .....	5
	D. A Four-Point Learning Productivity Agenda.....	5
	E. Aligning Learning Productivity with Accountability, Accessibility, and Affordability .....	6
	F. Wanted: Leadership for Resolving a Learning Productivity Crisis.....	7
III.	Profiles in Productivity: Examples of ICT-Enabled Improvements in Learning Productivity .....	10
	A. Tennessee Board of Regents.....	10
	B. The California State University.....	13
	C. Antioch University.....	15
	D. Immaculata University .....	17
	E. Rasmussen College Incorporated / Deltak edu and Partner Client Institutions .....	18
	F. Western Governors University.....	20
	G. Outside-In Question Box 2 .....	22
IV.	Education Is a Paradoxical Priority – Both a Solution and a Problem .....	22
	A. The Complexity of Connectedness.....	22
	B. Want Free Education? Then Free Education! .....	24
	C. Into the Learning Cloud.....	25
V.	The Conflation of Globalization, Innovation, Productivity, and Technology .....	25
	A. A Brief History of Technology .....	25
	B. The “Strategicness” of ICT in Education.....	28
	C. Outside-In Question Box 3 .....	29
	D. High Touch and High Tech Are Not Antithetical, Even in the Cloud .....	29
VI.	ICT-Enabled Strategies for Increasing Learning Productivity.....	31
	A. External Sourcing/Partnering Strategy .....	31
	B. Flex Program/Service Redesign Strategy .....	32
	C. Universal-Curriculum Redesign Strategy .....	34
	D. Outside-In Question Box 4 .....	36

VII. The Assessment Iceberg – Because Learning Is Difficult to Assess, Assess No Learning? .....	36
A. Outside-In Assessments: Learning-Centric, Learner-Centric, and Society-Centric .....	38
B. Learner-Centric External Assessments of Basic Fluencies and Critical Thinking Skills.....	39
C. Learner-Centric External Assessments of Nearly Universal Content .....	40
D. Low-Hanging Fruit: Assessments of Professional and Workforce Readiness .....	42
E. Outside-In Question Box 5 .....	42
VIII. The Pipeline Iceberg – the Demographic “Otherhood” and Other Issues of Scale .....	42
IX. The Economic Iceberg – Collisions in the Tertiary Education Economy .....	44
A. Public Revenues .....	44
B. Endowments .....	45
C. Revenues, Expenses, and Tuitions .....	46
X. Proposing an Education Assurance Commons .....	48
A. Education Assurance .....	49
B. Framework Assumptions for Developing an Education Assurance Commons .....	51
C. Possible Core Objectives for an EAC Compact .....	51
D. Implementing an EAC in the Learning Cloud – Two Critical “Interoperability” Functions .....	54
E. Seeding an EAC-Like Effort.....	57
XI. Conclusion.....	58
XII. Citations .....	59
XIII. About the Author .....	63

## I. Purpose

*The medium is the message.*

... Marshall McLuhan (1964)

*Education is the slowest form of learning.*

... Anthony Schwartz (of “daisy-ad” fame from the 1964 U.S. presidential election)

McLuhan’s meme about the entwinement between human communication and its enabling technologies remains insightful, even after an Internet-mediated global community of intertwined minds, cultures, and economies subsumed his television-facilitated “global village.” Virtual communities form ephemerally and more naturally from the bottom up than from the top down. This new human dynamic is virally innervated by what the *technorati* call the “computing cloud,” where we engage content and each other via Google, YouTube, Facebook, free blog sites, and other “cloudware.” Were he here today, McLuhan might quip that “the cloud is the content” or that “the cloud is the community of communities.” He might have rapped, without political bias, that President Obama’s campaign attracted a crowd in the cloud. Online self-service opportunities allowed citizens to interact with the campaign and each other, thus scaling the campaign’s “followership” and formatively reshaping its message. Magnetizing a crowd in the cloud trumped politicking-as-usual in both impact and efficiency.

Why, then, has the impact and efficiency of education not increased with its investments in information and communication technology (ICT)? In other sectors, ICT has been used to restructure business models to improve productivity and competitiveness while avoiding the perilous icebergs adrift in globalization’s changing seas. ICT has benefited the individual productivity of learners, instructors, researchers, and administrators, but education remains the “slowest form of learning” and an inefficient means to scale learning to meet modern needs. One reason is that education operates from the inside out – i.e., more directed by historical service models than by the changing learning modalities and needs of students and the goals of today’s public and private investors. To justify public funding, education is now expected to design learning opportunities to the mutual benefit of the learner and the learning needs of a civilization beset by complex cause-and-effect interactions within and among ecosystem, economy, and social equity. Intellectual capital has never been in greater demand and its “supply-chain” (the life-long-learning pipeline) leakier. This monograph frames today’s challenges to education from the outside in – i.e., from a tough-love vantage that honors the import of education and presumes to represent an idealized but rational public-policy enterprise and informed public. Its goal is two-fold:

- Provoke strategic thinking from within education about its collective need to redesign service and financial models for *assured* access, *assured* outcomes, and *assured* efficiency on a macro scale that is beyond the scope of any one institution, yet is also responsive to micro contexts.
- Explain why and how ICT provides the only leverage available, if education is to meet the modern world’s need for intellectual capital at a macro level.

As globalization inexorably washes over inside-out organizations and capsizes many in its wake, education leaders – whose *raison d’être* usually derives from an outside-in commitment to the common good – must band together to transform ICT from an “inside-satisficing” cost to an investment yielding an outside-in measurably strategic return in both macro and micro contexts (“satisfice”).

## II. Summarizing the Learning Productivity Crisis: Drivers and Remedies

*The Times They Are a-Changin'*

... Bob Dylan (1964)

*Ask not what your country can do for you – ask what you can do for your country.*

... U.S. President John Fitzgerald Kennedy (1961)

### A. Are the Times a-Changin' in Education?

Asked at an association meeting about the impact of the 2008 global recession on tertiary education, one college president conjured change beyond his control by replying, “**holy shift!**” For President Candace Introcaso of La Roche College, economic volatility has been churning seas that have for several years been rising and falling under growing swells of well-intentioned policy and regulation. She urged her colleagues to envision their institutions becoming, not **best in the world**, but **best for the world**. Her comments echoed the spirit of JFK’s inspirational inaugural admonition, while avoiding the internally-centric analysis that policy makers often attribute to education leaders. “Best for” also reflects the outside-in perspective presented throughout this monograph.

The “new economy” is increasing the visibility of and expanding, not only the economic iceberg that has been encroaching on comfortably navigable educational seas for several years, but also other icebergs involving, for example, student learning assessments and pipeline demographics. Education has deftly circumnavigated these expanding icebergs, but has done so without charting and promoting a new, holistic navigation plan – i.e., a new outcome-driven and quality-assured socio-economic compact between the public and the education enterprise. For example, a lack of collective vision and collaboration within U.S. tertiary education may have accounted for the chaotic results of the reauthorization of the Higher Education Act in 2008 – more than 1,100 sections of visionless, seemingly random congressional mandates and regulations. The times arguably still need a-changin’ from inside education.

An irony of the global economy is that it is powered by rising levels of education, individual and collective opportunity, and economic productivity, all the while requiring even greater levels of educational attainment to address a myriad of sustainability problems created through its accelerating feedback loop of economic competition and disruption. Policy makers around the world accordingly are proceeding, intentionally or not, as though education is too important and too slow in its current costly, artisan format to be left entirely to education insiders.

Regulatory paternalism paradoxically is a policy quest for *less regulation* – i.e., for a more open, expansionary education marketplace that, like the eBay marketplace, is regulated largely through internally operated trust infrastructure and mechanisms. Policy makers want competitive options for how credentialed learning opportunities are found, trusted, delivered, accountably assured, and afforded by governments and the people they represent. They envision an education marketplace that is at least as society-centric, learner-centric, and learning-centric as the current market is provider-centric. Before reacting to such policy paternalism, education leaders should reflect, from outside in, on the obligations they incur from tertiary education’s ascending global importance.

## B. The Brains Race and Its Implications for Leaders and Stewards of Tertiary Education

*Be ashamed to die until you have won some victory for humanity.*

... Horace Mann, Antioch University's first president, exhorting the graduating class of 1859

Education leaders live Mann's outside-in advice by helping the institutions they serve deliver "victories for humanity." During the 150 years since Mann's exhortation, however, victories for humanity have accumulated (in the form of research, invention, and interdisciplinary knowledge) to the point that everything and everyone are connected to everything and everyone else. The resulting complexities of global interconnectedness now have the ecosystem, economy, and social equity all hanging intertwined in a delicate balance between global sustainability and crisis. Education and the intellectual capital it creates and sustainably refreshes have never been more important to the modern world and a more fruitful investment! Intellectual capital appreciates in value at each stage of the life-long learning pipeline. In every modern geopolitical context, tertiary education has become a priority, if not *the* priority, according to a recent UNESCO communiqué (UNESCO 2009). In the U.S., for example, New York columnist David Brooks has synthesized recent research to suggest why the country's historical "35-year advantage on most of Europe" in educational attainment, which "boosted productivity and growth," has been rapidly deteriorating since the 1970s with the result that today's "skills slowdown is the biggest issue facing the country" (Brooks 2008), (Goldin 2008), (Heckman 2008). The core learning outcomes of education in the U.S. have not kept pace with the educational needs of an economy increasingly driven by the scientific and technological advances that owe partially and ironically to the pure and applied research conducted in tertiary education.

Nations are indeed jostling for competitive socio-economic position in a new form of arms race – a "**brains race**" for competitive national positioning in the global economy and long-term national social and economic security. Increasing the demand for, and the delivery capacity of, tertiary education has become a policy priority, especially in science, technology, engineering, and mathematics (STEM). With this good news about the priority importance of education also come volatile policy tensions. Reflecting a policy position that the brains race is too important to be led and managed solely by educators, the socio-economic compact between the public and the education enterprise is unraveling in degrees – or, pun intended, the pressing need for more of them.

The brains race is geopolitically universal in the modern world, but is arguably less pressing for a select few institutions than for all others. In the U.S., for example, relatively few private and public tertiary institutions draw a significant percentage of annual operating expenses from endowments and other private sources. These "well endowed" institutions are known for the top-tier academic researchers and academically accomplished students that they attract and nurture. Their prestige brands and their current practices may remain unaffected by the brains race. In any case, most other institutions have reputations that will rise and fall with their responsiveness to and accountability for the public policy agendas that are driving the brains race.

From a policy perspective, institutions emerging from the brains race with “winning” reputations will be able to account for measurably improved, “benchmarkable,” affordable educational outcomes. They will have “won” by redesigning learning opportunities and processes for 1) improved credentialing rates, 2) increased capacity for and greater convenience of access, 3) reduced per-credential expenditures, and 4) improved public accountability. Such accomplishments are counter-intuitive within the culture of education and its current “business model” based on credit-hours and FTEs. For example, instructor-to-student ratios are reliable direct proxies for per-credit and per-FTE expenditures, but are not reliable direct proxies for measurable academic outcomes – even though typically assumed by educators to be so (Ewell 2008). An FTE, after all, is an “input” not an “output.” Healthier revenues should follow from healthier educational outcomes, not the converse.

Education leaders need to think strategically about leading and managing by outcomes, rather than by the traditional input measures and the revenues that follow such inputs. In addition to providing fiduciary oversight, governing boards need to think strategically while advising and consenting on complex issues involving strategic financing and academic restructuring. “Following the money,” after all, leads to teaching and learning expenditures and begs difficult questions about the alignment between measurable academic mission obligations and the expense and efficacy of the academic strategies deployed to meet those obligations. These are sensitive questions for educators and, therefore, for the leaders and boards now urgently guiding their institutions/systems toward the truest embrace of mission and the highest levels of mission fulfillment, all within volatile but practical financial realities.

Education leaders need to think strategically about the implications of globalization for education. The brains race, after all, is a result of globalization and the interconnectedness of people, cultures, and economies. With globalization came innovative business models and increased productivity, all enabled by ICT. Indeed, it’s the other way around. With advances in technology came the ICT-enabled productivity strategies and innovative business models that have characterized globalization. Technology-enabled innovations below the surface of the globalization iceberg have battered, if not sunk, venerable business models in most sectors of the economy – consider, for example, the newspaper business in the U.S. Meanwhile, the credit-hour/FTE foundation of education’s business model remains largely unchanged and unexamined from the inside. Instead, many tertiary education leaders have reacted to globalization by establishing operations, physical or virtual, in foreign countries, while also recruiting more foreign students to a traditional “main campus.” Such activities, however, are only the visible tip of a globalization iceberg that needs to be more deeply understood by education leaders.

Many governing boards are blessed with members who have business backgrounds and are familiar with the sea-changing processes of globalization. They understand that ICT (in a business context) provides leverage for redesigning service models and business models to be leaner, more nimble, more productive, and more competitive. They know that overall cost containment can be counterproductive when compared to reductions in unit cost structures resulting from productivity initiatives. They know that the high-touch/high-tech balance point for service delivery is achieved by using ICT as the lever for increasing productivity through online self-service, while deploying high-

touch on an as-needed basis to individualize critical customer interactions with the goal of improving customer success and satisfaction. Today's banks, for example, provide both productivity-increasing online (asynchronous) self-service and individualized high-touch, as-needed services via corporate centers, branch banks, and a host of technology-mediated service centers.

This monograph explains the counterpart high-touch/high-tech roles in education – i.e., explains how ICT can provide leverage for measurably improving upon the socio-economic outcomes of education, while simultaneously improving its unit-cost structures to bring private and public investments in the education enterprise into affordable balance as the brains race accelerates to new levels of competition and scale. Education leaders and governing boards need to reflect collectively from the outside in – from the perspective of the socio-economic challenges that are driving the brains race. This document presents such an outside-in perspective on the education enterprise, with an emphasis on tertiary education. Main themes are interspersed with a number of highlighted sections titled “Outside-In Question Box,” a device to provoke strategic thinking and discussion about outside-in forces that are acting today in ways that are influencing the future of education and, likely, the future of your institution.

### C. Outside-In Question Box 1

1. What should be the role, if any, of your institution in the brains race?
2. How and with what results are various revenue streams being apportioned to quantifiable academic goals in your institution/system?
3. Which academic restructuring strategies can rebalance the private and public portions of those revenues for *mutually sustainable* affordability?
4. Is your institution focused on overall cost containment or on increasing institutional productivity with its byproduct of reduced unit costs – per-credential costs, for example?
5. Have you thought strategically about and discussed the future of tertiary education from outside in – about tertiary education's socio-economic compact with the public, its effectiveness in meeting public expectations and mission obligations to the public, its “business” or service model(s) and how they affect both public and private affordability, and how these “big themes” translate into the context of your institution/system?
6. Have you discussed globalization and its relationship to ICT-enabled innovation and program and service redesigns aimed at improving productivity? If so, what are the implications for tertiary education and, especially, your institution/system?

### D. A Four-Point Learning Productivity Agenda

Before outlining the “learning productivity crisis” in more detail, a basic outside-in oriented list of learning-related outcomes can be formulated as a “learning productivity agenda” featuring 1) a macro-level, geopolitically universal learning goal based on the brains race, 2) a micro-level learner-success factor that contributes to, but does not substitute for the learning goal, 3) an operating-cost factor to enable the achievement of the learning goal at macro scale, and 4) a trust factor to assure at a basic, common level the quality of education in ways that, while culturally challenging inside

education, are nevertheless inherently sensible from outside in. That the goal of the education enterprise is learning – or should be – is the outside-in justification for referring to “learning productivity,” rather than to “productivity,” which might be interpreted from the inside out to refer only to internal business and administrative functions and their costs. The phrase “learning productivity” was used some years ago in an academic report (Johnstone 1993).

The ***learning productivity agenda*** is the simultaneous need to:

1. Improve economic and civic security – by scaling and managing the life-long learning pipeline to increase the adult proportion of tertiary credential holders.
2. Increase credential attainment rates – by increasing annual ratios of credentials granted to total FTE students – or to total headcount enrollments.
3. Reduce per-credential “production” costs – by decreasing the annual ratio of total *Education and Related expenses* (see Section IX.C) to total credentials granted.
4. Validate and account for learning – by selectively using independent, constructivist, normative assessments to account for the effectiveness of the articulation between secondary and tertiary education and to account for the effectiveness of tertiary education in both its general education (learning-to-learn) and professional/workforce missions.

#### **E. Aligning Learning Productivity with Accountability, Accessibility, and Affordability**

Since early in the 21st century, outside-in pressures on the education enterprise in the U.S. have been expressed largely through three “A” words: accountability, accessibility, and affordability. For example, a recent report proposes a “model state higher education accountability system” (Aldeman and Cary 2008). Some recent articles even focus on the role of ICT in addressing the three-A agenda, and there is at least one public blog dedicated to tracking the three-A and learning productivity agendas (Graves 2007), (Graves, The Learning Cloud). To connect the three-A words to the learning productivity agenda, first focus on accountability and accessibility, and then parse them as follows:

##### **Accountability**

- Program Accountability: Respond rapidly to and account for economic development, workforce, and civic learning needs with appropriate credentialing programs.
- Learning Accountability: Measure and openly report selected learning outcomes in ways that permit normative comparisons geopolitically and among peer institutions.
- Expense Accountability: Report per-student Education and Related expenses on a program basis in terms of net tuition and “other” revenue categories – see Section IX.C.

##### **Accessibility**

- Affordability of Access: Reduce or stabilize inflationary increases in average net tuition (to keep tertiary education affordable for all learners).
- Convenience of Access: Offer learners convenient options for earning a credential, options that minimize requirements for real-time interaction.
- Capacity for Access: Manage enrollment capacity in response to demand.

The check marks (√) in the matrix that follows indicate the overlapping relationships between the outside-in outcome-oriented goals of the learning productivity agenda and the accountability obligations and accessibility strategies of the three-A lexicon. The most obvious relationship is the essential equivalence of learning accountability and accounting for the validity of credentials.

	Accountability			Accessibility		
	program accountability	learning accountability	expense accountability	affordability of access	convenience of access	capacity for access
<b>Improve economic and civic security.</b>	√			√	√	√
<b>Increase credential attainment rates.</b>	√	√				
<b>Reduce per-credential production costs.</b>			√	√	√	
<b>Validate and account for learning</b>	√	√				

***Learning Productivity versus Accountability and Accessibility***

Unlike the six-part three-A agenda, the learning productivity agenda makes clear the need in education and in government for collective, macro-level action. To “improve economic and civic security,” after all, is a goal that ultimately cannot be sustainably achieved by any single education provider or single government acting solely through self-interest. That is why there is a compelling need for collective action to “assure education” – as described in detail through the concept of an “education assurance consortium” in Section X.

Meanwhile, a broader outline of the complexities involved in learning productivity will justify in more detail the four-point learning productivity agenda, its claimed crisis dimensions, and its linkages to the broadening global discussion about accountability, accessibility, and affordability. The outline that follows will not explicitly cite the need to “validate and account for learning” – the fourth point in the four-point learning productivity agenda. A degree mill can meet the other three goals of learning productivity, after all, and, so, an independent assessment of quality (demonstrated, normative learning outcomes at some level) is important and also a reasonable outside-in policy expectation. How to meet this expectation is addressed in Sections VII and X.

**F. Wanted: Leadership for Resolving a Learning Productivity Crisis**

Education leaders now have to think strategically, from an external policy perspective, about the life-long learning pipeline, its cultural and economic demographics, and the necessary role of globalization and its ICT stalking horse in sustaining tertiary education as the wellspring of continuing victories for humanity. The starting point is to identify the imperatives and influencing factors that surround education today in every modern geopolitical context. This is attempted below in outline form with only brief explanations – more detailed analyses to follow in subsequent sections. The outline below is followed in the next section by case studies to illustrate leadership and strategies that, in significant part, were ICT-enabled and increased learning productivity.

**1. Recognize that tertiary learning has become a non-negotiable priority in the modern world.**

The brains race is in full swing – and for good reason. The future depends on simultaneously balancing the three globally inter-dependent variables of *ecosystem*, *economy*, and *equity* to ensure the future sustainability of each. Every modern nation has embraced education as both 1) a competitive edge for national economic and civic security and, paradoxically, 2) the enabler of the inter-nation, cross-cultural collaborations required to resolve the *three global “E” crises* for the common good of civilization. The catchphrase to “think globally and act locally” could be more accurately framed as an exhortation to “act locally while collaborating globally” – through the globally coordinated, standards-based digital information and communication system.

**2. Meet priority public policy demands for increasing the proportion of adult populations holding tertiary credentials.**

In the U.S., for example, President Obama has called for increasing the proportion of the adult population holding a tertiary credential from 39 percent today to 60 percent in 2020. This goal will require compounded annual growth of at least 5 percent in the proportion of adults holding a tertiary credential. Meanwhile, the bachelor’s degree completion rate in the U.S. has slipped to 25th among the 26 nations profiled by the Organization for Economic Cooperation and Development in 2008 – only Italy ranked lower (OECD). President Obama’s goal is, to say the least, financially and academically ambitious. Indeed, a recent paper from the Association of Public and Land-Grant Universities finds the goal too ambitious, but goes on to analyze a variation on the President’s goal to be realistic (McPherson and Shulenburg 2009). Such goals are also less a question of meeting demand than of increasing demand for tertiary education, especially in areas such as science, technology, engineering, and mathematics (STEM).

Many learners of all ages cannot (or prefer not to) participate in credentialing programs that have extensive requirements for real-time interactions – face to face or otherwise. President Obama’s bodacious goal, thus, will require increased access to credentialing programs that are both optimized for high-tech, asynchronous online self-service and complemented by as-needed, individualized, high-touch responses to student queries for assistance. Such *flex programs and services* not only increase *convenience of access*, but also improve *affordability of access* by eliminating or reducing the student’s expense of taking time off from job or family or relocating or commuting on a regular basis to a campus. This “flex strategy” is explained in more detail in Section VI.

**3. Increase tertiary credentialing rates.**

Increasing credentialing rates is a necessary, but not sufficient, strategy for increasing the proportion of the adult population holding a tertiary credential at the rate implied, for example, by President Obama’s aggressive target. Both the leaky life-long learning pipeline and its demographics have to be considered. More holistic thinking pulls all of these variables together into the imperative immediately below.

**4. Repair the leaks at every level of the lifelong learning pipeline, especially at the secondary level, while simultaneously expanding its tertiary volume and meeting the academic and financial needs of first-generation, underprepared, needy learners who demographically account for an increasing proportion of the tertiary pipeline.**

While population growth rates vary from place to place, demographic increases in diversity are nearly universal. Increasing the proportion of the adult population holding a tertiary credential will require redesigning **enrollment management strategies** – from recruiting strategies to student-success strategies – in order to realign the demographics of the student body more closely with overall diversity trends along dimensions of race, ethnicity, culture, national origin, educational preparation, age, and income. Whatever the variations on the dimensions of increasing diversity, the results in educational terms are an increasing proportion of prospective students at the tertiary level who are first-generation, underprepared, and needy.

**5. Reduce or stabilize per-credential expenses.**

A recent cost/revenue analysis from the Delta Cost Project based on national U.S. data from 2002-2006 reveals that per-credential expenses are endangering the affordability of access from the perspective of both the private and public revenue sources that support tertiary education in the U.S. More generally, the education enterprise cannot cover its expenses by relying too heavily on either public or private revenues without compromising, respectively, public financial support and/or private affordability. In light of the increasing proportion of needy students in the pipeline (II.F.4), the economic path to the overall goal of the brains race (II.F.2) is to reduce or stabilize per-credential expenses.

Even when combined with overall reductions in per-credential expenses, the aggressive growth rates reflected in President Obama’s goals (II.F.2) may not be achievable within the current FTE/credit-hour business model. Just as health-care in the U.S., for example, has expanded to economic crisis dimensions relative to the overall economy, so too the education enterprise in the U.S. and elsewhere may face a business-model (service-model) crisis by “consuming” a proportion of the overall economy that is increasing to the point of unsustainability.

The resulting need to contain per-credential expenses in the process of scaling accountably effective learning through a pipeline increasingly weighted by underprepared, needy learners presents a productivity dynamic – indeed, a **learning productivity crisis!** Learning productivity may not appear *a priori* to involve technology. Recent history, however, confirms the connection. ICT-enabled process redesigns and innovations have fueled globalization and its new levels of competitiveness and productivity.

**6. Improve and assure learning productivity at scale through the strategic leverage of ICT.**

- a. Develop a “culture of performance” – based on a “culture of evidence” that creates, tracks, reports, and acts on performance metrics through ICT-enabled performance analytics and normative, transparent reporting. ICT is the only available leverage for creating a transparent culture of performance at the scale foreseen by the brains race.

- b. Recognize that learning productivity is a strategic leadership issue for C-level officers – who must not only “talk the talk,” but also “walk the talk” by supporting and managing the intra- and inter-organizational rivalries and collaborations required to practice and accomplish what is “talked.” Performance improvement and learning productivity goals can be supported by, but not “owned” by the ICT organization.
- c. Apply three primary ICT-enabled redesign strategies – universal-curriculum redesign, flex program/service redesign, and external sourcing/partnering redesign. These strategies, described in detail in Section VI, have been proven to improve learning productivity. In various combinations they can, at scale, improve productivity across the education enterprise by acting “locally” and collaborating “globally” – as proposed in Section X on “educational assurance.”

Item 6 and its ICT-related points are covered later in the education-related details of globalization and its relationship to ICT. Before getting to that detail, however, some examples of the strategic use of ICT in education should help illuminate the learning productivity agenda.

### III. Profiles in Productivity: Examples of ICT-Enabled Improvements in Learning Productivity

A few examples will illustrate various reasons and strategies for responding to the learning productivity crisis. Some leaders, governing boards, and policy bodies a few years ago foresaw, in their contexts, the need to increase the proportion of tertiary credential holders and responded with ICT-enabled innovations and redesigns pointing the way forward. Others moved forward for different reasons, perhaps less concerned about the brains race and more concerned about financial pressures and other pressures related to outside-in accountability, accessibility, and affordability expectations. Still others were staking out new business models designed to serve underserved populations and unmet economic needs. Even without knowledge of the taxonomy used here to describe the learning productivity crisis, the institutional and system efforts outlined and described below depart from the traditional strategy of depending on random acts of progress and productivity. They instead offer timely glimpses into how tertiary education can use the leverage of ICT strategically to improve upon selected aspects of learning productivity. Each example is accompanied by a matrix implying in broad terms which of the three strategies cited in II.F.6.c contributed to which of the learning productivity agenda’s four imperatives.

#### A. Tennessee Board of Regents

TBR	ICT-Enabled Strategies for Innovating/Redesigning/Restructuring Programs and Services		
	external sourcing/partnering redesign	flex program/service redesign	universal-curriculum redesign
Improve economic and civic security.	√	√	√
Increase credential attainment rates.	√	√	√
Reduce per-credential production costs.	√	√	√
Validate and account for learning.			

State financial support for public tertiary education in Tennessee has been declining for over a decade. During the same time period, policy pressure to improve accountability, accessibility, and affordability has also been increasing. Meanwhile, the Tennessee Board of Regents, the TBR executive leadership staff, and the public TBR constituent universities (6), community colleges (13), and technology centers (26) have been managing this tightening vise of mounting financial and policy pressures, not by reducing the scope of the TBR access mission, but by systemically improving learning productivity. The Regents have guided and assisted the TBR executive staff to ensure 1) that resources are allocated to productivity initiatives, even as state funding has declined on an overall per-FTE basis, and 2) that economies of scale are achieved through system-wide, inter-institutional planning, purchasing, and academic programming.

The TBR comprehensive productivity strategy includes an academic audit process and an “Academic Leadership Institute” to assure that major productivity initiatives are 1) based on mission performance metrics aligned with accreditation quality requirements and the state’s education needs, and 2) planned and managed within a culture of performance that values not only traditional campus autonomy, but also the leverage of system governance and system-wide collaboration. During the past decade three major productivity initiatives have relied on the ICT-enabled strategies of flex program / service redesign, external sourcing / partnering redesign, and universal-curriculum redesign.

The first ICT-enabled learning productivity initiative started at the turn of the 21st century in response to the state’s competitive economic need to increase the proportion of its adult population holding a tertiary credential. The result was the *Regents Online Degree Program (RODP)*, a set of flex (online, asynchronous) degree offerings aimed at increasing both the college-going rate and the percentage of adults who return to college to complete a tertiary credential. To ensure that any RODP program is a collaborative offering that is “sharable” among TBR institutions and their enrollees, RODP business policies apportion RODP course revenues among the RODP system office and the (potentially) two campuses involved, one serving as a learner’s “home” campus and the other as a campus enrolling the learner in an RODP course offering. The RODP demonstrates system-wide consistency in student services, a well-articulated learning experience, and standardized common curricula where the rationale for inter-institutional standardization and transfer of credit is most compelling. The RODP course and program offerings also mitigate a number of perennial issues facing the individual TBR institutions – course and classroom inventory and capacity, instructor availability, and so on. Turning, during the multi-year start-up phase, to a company that is now part SunGard Higher Education, the TBR externally sourced academic program development consulting services and 365 x 24 ICT support for RODP’s learners and instructors. Today the TBR externally sources flex tutoring services from SmarThinking on behalf of the RODP and other programs.

Not only are too many first-year TBR students requiring developmental work, but the cost of “college-readiness” remediation has been estimated at \$25 million on a statewide basis. The TBR urged its executive staff and the TBR constituent institutions to collaborate in redressing the remediation issue with a major ICT-enabled initiative designed both to boost student success and

reduce remediation costs – another productivity imperative, one that further strengthens the successful RODP productivity initiative. Supported by a grant from the Fund for the Improvement of Post-Secondary Education, the TBR faculty and staff have partnered with the Education Commission of the States and the National Center for Academic Transformation. As a matter of policy and in the interest of efficiency, remedial instruction has been shifted system-wide solely into the TBR community colleges. The TBR redesign team is applying the ICT-enabled universal-curriculum redesign strategy in the developmental curriculum to 1) increase student engagement, 2) provide prompt feedback to students, 3) offer high-touch individualized instruction and assistance on an as-needed basis, and 4) modularize instruction in order to get students into credit courses as soon as they are individually ready. (Note: The NCAT seminal high-enrollment “course redesign” methodology is the genesis for what is called herein the “universal-curriculum redesign strategy.”) A pilot effort in mathematics remediation at Cleveland State Community College has already been awarded the 2009 Bellweather Award for Innovation and, at the request of the Regents, is being replicated across the TBR system. Preliminary analyses of these various efforts demonstrate that new TBR policies and ICT-enabled strategies are both improving learning outcomes and reducing the per-student cost of remediation, while also speeding students’ time-to-enrollment in credit coursework.

The RODP model that has drawn the TBR community colleges and public universities into closer collaboration on behalf of for-credit access / success and system-wide efficiencies has been adapted to non-credit continuing education and also to workforce development programs offered through the TBR Technology Centers. The combined “enterprise” is now known as the Regents Online Campus Collaborative. ROCC innovations in the area of workforce development include Technology Foundations, an online-based individualized course of study designed to inculcate the basic skills identified by industry as the foundation for success in the workforce – reading, writing, quantitative, and information searching / filtering fluencies. Complementing the Technology Foundations course is an opportunity to earn a National Career Readiness Certificate to enhance other workforce credentials and experiences by certifying the student to be “work ready.” The TBR has insisted that the Technology Centers, like the universities and community colleges, adhere to standard curricula to the extent possible and to the learner centricity characterized by the convenience of access to flex programs and services. Programs are delivered to the extent possible in a high-tech asynchronous online self-service modality, but are complemented by real-time or nearly real-time access to high-touch individualized assistance when needed by the learner or dictated by pedagogy.

Seeded by the exceeded-expectation successes of the RODP in the early 2000s, the ROCC now accounts for a headcount approaching 10,000 (yielding course enrollments of over 15,000) including many who would not be in college had not the TBR insisted on using the leverage of ICT to address pressing productivity issues on a system-wide level on behalf of public tertiary education in Tennessee. The success of the cumulative, integrative ROCC model was recognized with a Platinum award in the 2008 IMS Global Learning Consortium’s Learning Impact Awards Program.

**B. The California State University**

Cal State	ICT-Enabled Strategies for Innovating/Redesigning/Restructuring Programs and Services		
	external sourcing/partnering redesign	flex program/service redesign	universal-curriculum redesign
Improve economic and civic security.	√	√	
Increase credential attainment rates.	√	√	
Reduce per-credential production costs.	√	√	
Validate and account for learning.	√		

The California State University, the largest public university system in the U.S., faces an unparalleled challenge to meet the tertiary needs of a “majority-minority” state. The CSU does an exemplary job of continuing to ensure that applications for admission, offers of admission, and enrollment of its first-time freshman class reflect the proportion of student by race and ethnicity of California public high school graduates who complete the fifteen college preparation classes required by both the CSU and the University of California). Nevertheless, the CSU is acutely aware of the incredibly high number of students who drop out of K-12 and, therefore, never earn the opportunity to advance to postsecondary universities. Recognizing the high drop rate, and in an effort to close the achievement gap, the CSU has worked to ensure that a growing proportion of Hispanic, African-American, American Indian, and Asian Pacific Islander students receive the academic preparation they need in order not only to graduate from high school, but also to apply, enroll, and graduate from college. To achieve that outcome, the CSU expanded its outreach and student academic preparation programs to provide information and academic support to California’s diverse K-12 population. Student academic outreach programs target students who are disadvantaged educationally and economically, who are enrolled in public schools that have low college-going rates, and who need assistance in strengthening basic skills in math and English. These programs provide academic support services that raise the aspirations and improve the academic performance of students, advise students about courses needed to meet admission requirements, help students acquire English and mathematics skills needed to succeed in college, provide instructional programs for students requiring academic support before they matriculate at a CSU campus, and provide retention services to students after they enroll in CSU. Many of these services are delivered partially online.

Charles Miller, chairman of the Secretary of Education’s Commission on the Future of Higher Education (aka the Spellings Commission), identified the CSU as having implemented one of the best national models of how higher education and K-14 can collaborate to help expand access to underserved students and to help students prepare academically for the rigors of college by expanding academic outreach to underserved communities and providing an early warning signal to students about how well they are acquiring English and mathematics skills.

CSU has forged successful relationships with Hispanic and African-American parents through their community barrios and churches, respectively. Parents of college-age children now better

understand how to motivate and help prepare their children academically and financially for admission to the CSU. CSU is raising awareness of college opportunities by reaching future students where they are – in their homes, their churches, and their communities. Partnering with community leaders and the state’s K-12 system, administrators are targeting low-income and minority students and putting high education within their reach. The chancellor and campus presidents visit the African-American churches in Los Angeles, San Francisco Bay area, San Diego area, and California’s Inland Empire. An informational “How to Get to College” poster available in English, Spanish, Vietnamese, Korean, and Chinese provides step-by-step advice on how students and parents can begin getting ready for college as early as the sixth grade.

To avoid duplicative costs to the state and to increase retention and graduation rates, the CSU has partnered with the state’s public school system to include a bank of CSU-prepared math, English, and writing assessment items in a statewide (required) test known as the Early Assessment Program (EAP) and administered to all 11th-grade students. The EAP is designed to test students’ proficiency in mathematics and English and to reduce the likelihood that students will have to take remedial classes once they enter college. Students accordingly learn at the end of 11th grade whether they are on track in the acquisition of English and math skills that they will need to succeed in college. Those who are not prepared receive advice about classes and programs they can take in 12th grade to improve their skills. Some of these classes and programs are delivered in the online flex format cited in III.F.6.A. Through an ICT-enabled collaboration between the CSU faculty and school teachers, these underprepared learners have online access to learning materials and tutorial help during their final year in secondary school. The CSU is experiencing an increase in Hispanic and African-American enrollments and a decrease in the proportion of first-year students requiring remediation.

Finally, the California State University Board of Trustees adopted in 2003 a three-part initiative designed to improve student services for undergraduates. In addition to the Early Assessment Program (EAP), the Trustees adopted a system-wide initiative to help students graduate, as well as set out a clear path for lower division transfer students from community colleges. These initiatives remain a priority for the CSU particularly as many of its freshmen are from traditionally underrepresented communities. Many CSU freshmen are also the first in their family to attend college. CSU has made the success of these students a system-wide priority with the overall goal of increasing students’ graduation rates and reducing the time take to graduate. These initiatives include programs dedicated to enhancing undergraduate success toward a degree with augmented undergraduate degree advising, student learning centers, tutoring, and study skills programs, as well as additional resources to work directly with community colleges on transferring students. Again, these efforts depend, in part, of the convenience and accessibility of online learning / advising resources and online communications.

The CSU Trustees have supported and advised Chancellor Charles Reed throughout the process of sustaining an enrollment demographic that reflects that of the state, increasing the college-going rate and preparedness of the least prepared and neediest high-school students, and improving the success rate of all students.

### C. Antioch University

Antioch	ICT-Enabled Strategies for Innovating/Redesigning/Restructuring Programs and Services		
	external sourcing/partnering redesign	flex program/service redesign	Universal-curriculum redesign
Improve economic and civic security.		√	
Increase credential attainment rates.		√	
Reduce per-credential production costs.	√	√	
Validate and account for learning.	√		

Antioch University owes its origin to the historic liberal arts college established in 1852 as Antioch College. Following its development of numerous graduate campuses across the nation in the mid 1960s and 1970s, Antioch College in 1978 changed its name to Antioch University. Today the University “physically” encompasses five adult-oriented graduate campuses in Los Angeles and Santa Barbara, California; Seattle, Washington; Keene, New Hampshire; and Yellow Springs, Ohio. There is, however, more to the story – much more!

The Antioch University Board of Governors made the emotionally difficult but financially responsible decision in 2007 to suspend the operations of Antioch College effective a year later in 2008. In 2009, the Board and the Antioch College Continuation Corporation (ACCC) unanimously approved and culminated a joint agreement that allowed the University to transfer the College campus (and endowment) to the ACCC for the purpose of creating an independent college in Yellow Springs, Ohio.

The Antioch University Board is now governing the University to evolve as a national, multi-campus, private (independent) non-profit *system*. Board leadership has been required, not only to chart a path through the financial realities that afflicted the College, but also to help the University’s five rather autonomous graduate campuses coalesce into a unified system to take advantage of the academic and financial leverage that a system offers – leverage that can be amplified through ICT-enabled academic and administrative redesign strategies. To assure timely, local leadership attention to the campuses and the local community needs they serve, the Board of Governors recently created five subordinate local boards of trustees, one per campus to help select presidents and monitor programmatic directions and fiscal resources.

In the late 1990s, well before suspending the operations of the College, the University tapped its system leverage by introducing an innovative program independent of any campus. Using the ICT enabled flex program / service redesign strategy, the University developed a “courseless” and “placeless” Ph.D. program in Leadership and Change. This flex program has successfully demonstrated that academic and financial success need not be hostage to a business model based solely on courses, credit hours, and FTEs. The program produces a high number of graduates per headcount and is economically efficient, with 70 percent of its subscription-based revenue going directly to instruction. Anchored in the values of Antioch’s academic and service mission, the

program encourages learner reflection and peer collaboration through ICT-enabled and periodic face-to-face learning – quarterly residencies of 2-4 days. It is cohort-based, yet allows for self-pacing and boasts excellent student and faculty satisfaction scores. Exceptional retention and graduation rates of 75 percent exceed national averages for doctoral programs of 50 percent or less. The U.S. Department of Education attested to the program’s success in its recent report, “Evaluation of Evidence-Based Practice in Online Learning.” A key factor in the success of this now mature innovation was the board’s unwavering support for the Chancellor and the program’s “entrepreneurial” academic leader during program development and enrollment ramp up.

The University’s five campuses are intentionally small, approximately 1,000 plus students with 85 percent enrolled in graduate professional programs. With input from faculty, students and the Board, the University is now deciding which of its masters’ programs can best be served by University-wide doctorates rather than by a proliferation of expensively small doctoral programs at each campus. Extending the ICT-leverage demonstrated by the seminal leadership and change program, a new University-wide flex Ed.D. will target professionals who engage in education for social change, including international students and, especially, graduates from MA in Education programs at Antioch’s five campuses. Similarly, a University-wide flex DBA program in sustainability will complement the varied masters’ degrees in environment and sustainability extant across all the campuses.

The University is also evolving a Virtual Commons for students and faculty from all campus- and non-campus-based programs in order to increase productivity not only in academic programming, but also in administrative and student support services. For example, a Virtual Commons Library is already accessible to all Antiochians and is allowing each campus to increase the quality of its library holdings and services through joint purchases, shared software, and digital archives. The Commons will also incorporate tutorial labs in ESL, math, writing, and foreign languages for all students. Indeed, using the ICT-enabled universal curriculum strategy, the Commons has the potential to increase collaboration and financial savings system-wide by delivering a quality-designed cluster of flex (online, asynchronous) courses common to the varied curricula of all or most campuses.

In recognition of the importance of learning productivity to the future sustainability, the University is using some of the data elements and annualized metrics promoted by the Delta Cost Project. For example, the ratio of total Education and Related (E&R) expenses to total student headcount provides one measure of educational unit costs, while another is the ratio of total E&R expenses to degrees granted. The ratio of degrees granted to total headcount provides a metric for degree production rates. Using such ratios to make comparisons across University campuses and programs and, externally, with peer institutions, the Chancellor and the Board of Governors can analyze trends and establish and monitor academic and financial target goals.

The University has also invested in a system-wide student outcomes project to identify consistent system-wide learning-outcome metrics for public consumption – job advancement, passing rates on state or professional licensure, scholarship, additional certifications acquired, continuing education achievements, and community service. Compilation of such data will not only allow individual

campuses to herald their outstanding alumni, but also provide substantial data to establish the University’s national presence and contributions.

Even before suspending the operation of Antioch College, the University’s Board supported and protected the development of the innovative flex Ph.D. in Leadership and Change. In working through the challenges presented by the College, the Board’s commitment to the Antioch *system* and to further ICT-enabled innovation has grown stronger. With purposeful support from the Board of Governors and its campus-based boards of trustees, Chancellor Tullisse (Toni) Murdock is leading the University towards a future in which ICT-enabled innovation and improved productivity will be the norm. This course of action is exactly what the Board expects of the Chancellor in shaping Antioch’s unique and evolving chapter in the U.S. history of tertiary education. Indeed, the future bodes well for governance that links finance to metrics at the system and campus levels to reflect and achieve Antioch’s strategic mission goal to help secure and sustain “victory for humanity.”

**D. Immaculata University**

Immaculata	ICT-Enabled Strategies for Innovating/Redesigning/Restructuring Programs and Services		
	external sourcing/partnering redesign	flex program/service redesign	universal-curriculum redesign
Improve economic and civic security.	√	√	
Increase credential attainment rates.	√	√	
Reduce per-credential production costs.	√	√	
Validate and account for learning.			

Located near Philadelphia, Immaculata University is a Catholic, comprehensive institution serving men and women of all ages. The residential campus is situated in a region that is home to 85 institutions of higher education and competition for enrollment is intense. While retaining its undergraduate liberal arts core the university has improved its financial position, by meeting the adult learning needs in the Philadelphia area, often through accelerated learning (ACCEL) programs delivered totally or in-part using the latest Web-based technologies.

While Immaculata’s Board of Trustees (BOT) does approve significant purchases of technology they typically are not involved in the decision-making aspects of the university’s technology needs. . Recommendations for purchases are provided to the BOT by the executive administration and include associated costs and justification for the purchases. In approving such technology purchases, because of their fiduciary responsibility, trustees typically ask questions relating to cost, need, what improvements will be made to operations, how the new technology will improve service to students, faculty, and staff, and how long it will take to implement the new technology.

In 1998, Immaculata University externally sourced its on-site ICT leadership, management, and expertise to improve ICT services and enhance the coordination and leverage of administrative and academic computing functions. All ICT services were consolidated into one unit, a 365 x 24 help desk

was provided for all students enrolled in Web-based and Web-enhanced courses, and Immaculata’s ERP and LMS (learning management system) applications were “virtualized” on servers in the partner company’s Internet Data Center. Having its applications hosted off-site is predicted to save the university \$295K during the first four years of operation.

In 2008, Immaculata began implementing a new LMS. During the first year of the project, the institution was able to maintain its projected 30 percent increase in enrollment in totally online classes, generating more than \$3.4 million in tuition revenue. An additional 260 Web-enhanced courses were supported, involving more than 4,680 students. More than 350 full- and part-time faculty and staff were trained in using the new LMS, thereby increasing the number of instructors using the new system by 10 percent.

The institution with its partner company’s assistance was able to re-negotiate vendor contracts, providing anticipated savings exceeding \$1.5 million over the next six years. During the first project year was also able to secure \$40K in grants and external funding. Immaculata was awarded the 2009 SunGard Higher Education Award for Institutional Performance for its achievement in leveraging its technology for strategic purposes and for its successful migration to the new LMS and the resulting, scalable enrollments it is generating.

**E. Rasmussen College Incorporated / Deltak edu and Partner Client Institutions**

Rasmussen / Deltak	ICT-Enabled Strategies for Innovating/Redesigning/Restructuring Programs and Services		
	external sourcing/partnering redesign	flex program/service redesign	universal-curriculum redesign
Improve economic and civic security.	√	√	
Increase credential attainment rates.	√	√	
Reduce per-credential production costs.	√	√	
Validate and account for learning.			

Rasmussen College Inc. was formed in 2004 as a privately held company to combine Rasmussen College (founded in 1900 by Walter Rasmussen) with Deltak edu, an established online education organization. Today the overall organization is a premier provider of online educational experiences delivering Bachelor’s, Master’s, Doctoral, and Associate’s degree programs through its network of 17 campuses and partnerships with leading universities. Rasmussen serves more than 15,000 students in fifty states and five countries through its Rasmussen College and Deltak edu divisions. Deltak edu is an operating unit of the parent company separate from the operations of Rasmussen College. Multiple colleges and universities externally source services from Deltak (under a business process outsourcing arrangement) for curriculum development, marketing services, recruiting and admissions operations, and ongoing student-care and technical support services for selected online Master’s and Doctoral programs. Deltak’s external client partners include Gonzaga University, University of Scranton, Creighton University, Utica College, The Chicago School of Professional Psychology, Saint Joseph’s University, and others. Deltak’s collaborative business model sets

Rasmussen apart from most other tertiary education providers. Deltak's start-up and continuing programmatic support are provided risk-free to its partner tertiary client institutions in return for a negotiated share of enrollment revenues from the resulting online (flex) offerings. This "flat-world" external-sourcing business model appeals to institutions that are constrained by lack of capital and the risk-aversion that comes with being tuition dependent. The success of the model demonstrates how for-profit and nonprofit institutions can come together on mutually beneficially grounds. Saint Joseph's University provides a good partnership example.

Historically strong in the private (independent) university sector in Philadelphia, Saint Joseph's University found itself challenged early in this decade by selected peer competitors' entrepreneurial forays into and aggressive resource commitments to online (flex) programs designed to serve adult students. Saint Joseph's University responded through a grant received shortly after 9/11 to develop online training for first responders through an "Emergency Responders Distance Learning Center" (ERDLC). Using its internal course design and development capabilities, the University went on to develop several online certificate programs related to homeland security, crisis management and other emergency response related programs, as well as a set of fully online degree programs that included an Online Accelerated Teacher Certification program. Saint Joseph's University thus established the internal capability to design and build online programs. Meaningful enrollment and revenue growth nevertheless failed to materialize from these efforts after several years in the marketplace.

In 2008, Saint Joseph's University's Erivan K. Haub School of Business, which is AACSB accredited and well respected in the Northeast, decided to expand its Master of Decisions and System Science program into the online environment with the objective of reaching a growing market of prospective students for online flex programs. The University again was challenged to find a student market for the program, and ultimately was connected to Deltak through fellow Jesuit institution, Gonzaga University. Saint Joseph's University and its Board determined that a partnership with Deltak would reduce risk and, with high probability, assure the long term success of the new business program and other online programs.

As suggested by Deltak, the partners first worked together to give the Decision Systems and Sciences program a more marketable and relevant name: Master's in Business Intelligence. Deltak then developed a marketing strategy to generate media interest and alert potential students to the online program. The strategy included event marketing and publicity to draw attention to the program. Armed with the first fully online MS in Business Intelligence, Saint Joseph's University chose The Data Warehousing Institute™ Conference as the most appropriate forum for the launch. TDWI's mission is to foster a community of learning where business and IT technical professionals come together to gain knowledge and skills, network with peers, and advance their careers. Understanding that there would be an engaged and qualified audience at the conference, Deltak secured and staffed a booth for Saint Joseph's University to announce the launch of the new program. The conference produced great interest and generated a significant number of qualified inquiries. Deltak also took advantage of its presence at the conference to engage and educate the media on the launch of the online Business Intelligence program by setting up editorial interviews

with several influential media outlets in attendance, including DM Review, B-Eye Network and Business Intelligence. The interviews resulted in several articles and a monthly column for the program’s faculty chair on the B-Eye Network website.

The increased visibility generated through the TDWI conference, combined with Deltak’s online marketing methods, led to a successful launch of the Business Intelligence program. Almost immediately, enrollment in the online program surpassed that of its campus-based counterpart. The new marketing strategies and efforts have further paid off by generating enrollments from markets that were previously inaccessible to the University, while also significantly increasing the diversity of its student body. At present, Saint Joseph’s partnership with Deltak accounts for several hundred students enrolled in six fully online Master’s and six graduate certificate programs in Teacher Education, Business, and Criminal Justice.

**F. Western Governors University**

WGU	ICT-Enabled Strategies for Innovating/Redesigning/Restructuring Programs and Services		
	external sourcing/partnering redesign	flex program/service redesign	universal-curriculum redesign
Improve economic and civic security.	√	√	
Increase credential attainment rates.	√	√	
Reduce per-credential production costs.		√	
Validate and account for learning.	√		

Western Governors University (WGU) was created in 1997 by 19 western governors with the goal of using technology to create a new model of higher education that would improve the productivity of higher education. Productivity, in this sense, means increasing the measure of educational attainment per dollar of expenditure, and therefore relates both to learner productivity and to operational or institutional productivity – learning productivity. WGU’s two central innovations are its 1) focus on competency-based education, or in other words, on measuring actual learning rather than learners’ time, and 2) use of technology as the primary means of instruction, rather than as the means to distribute classroom instruction, as is the case with most online learning today. The founding governors set the mission and goals for the institution, and then appointed an independent Board of Trustees to assist the University in achieving its purpose.

Perhaps the characteristic that most differentiates WGU from other institutions is its institutional accountability for learner productivity. For example, time-to-graduation is a compelling metric for learner productivity. WGU students graduate with a bachelor’s degree on average in 31 months, compared to 60 months nationally. However, this time-to-graduate result is not achieved by compromising education standards. In fact, because students must demonstrate mastery of every competency at the equivalent of a “B” grade or better on each assessment, WGU graduates meet a higher standard than the “C” average required of graduates from other institutions.

Key to various measures of learning productivity is the University's system of competency-based education, in which students are awarded degrees by demonstrating what they know and can do, rather than accumulating credit hours or clock hours. Simply stated, the WGU educational model is based on 1) competencies developed with industry experts (ensuring workforce-relevant degrees), 2) self-service instruction that eliminates the need to spend "seat time" learning material already familiar to the student, and 3) both objective and performance-based assessments of learner competencies. Technology-enabled self-service instruction allows all learning to be individualized and self-paced. Students only spend time learning what they do not already understand at the mastery level, and they learn at their own individual rates.

Today WGU has over 15,000 students, and continues to grow at over 30 percent annually. Most significantly, in terms of institutional productivity for a private, non-profit university, WGU is self-sustaining on tuition of under \$6,000 per year for most programs. More strikingly, annual tuition at WGU has increased by a total of only \$200 in the last four years, demonstrating that operational productivity is still increasing. This institutional productivity is the result of using technology innovatively.

Whereas other institutions use technology to supplement and/or deliver classroom instruction, WGU actually uses technology to deliver instruction. In fact, WGU does not develop or teach any of its own courses; instead, the WGU faculty identifies the best existing courses and acquires the right to use them with WGU students. The primary role of the full-time WGU faculty is to mentor students to guide them, answer their questions, lead discussions among and with them, and monitor and encourage their progress. Test development, delivery, and grading are handled separately by an assessment department. This disaggregation of mentoring and testing supports specialization, efficiency, and the independent validity of testing results.

Technology is also used throughout WGU's business operations to increase efficiency, which translates into lower-cost education for students. Most University employees work from home via a computer and a telephone. Technology allows for transparent operations from anywhere, and also provides productivity measures for all employees. The University markets to students via the Internet, and enrollment processes are largely automated. WGU uses student and mentor web portals, the SAS data system for institutional research, and Banner technology to support student records and services. A customer relationship management (CRM) system will soon link together all WGU departments efficiently and effectively with the students they serve.

The WGU Board of Trustees is responsible for appointing the President, overseeing and approving University finances and budgets, guiding major strategic thinking, and regularly monitoring institutional and learning productivity. The Board serves for three-year terms that are staggered so that one-third of the board is elected each year. There is a concerted effort to appoint Board members who have experience in areas key to WGU operations. At any time, two sitting governors (one Republican and one Democrat) represent the now 20 member state governors who support the WGU. Other Board members provide higher education experience and/or industry experience in one or more of the four degree areas offered by WGU: information technology, teacher education, health professions, and

business. The Board meets three times a year – generally once on the east coast, once on the west coast, and once in conjunction with a graduation ceremony in Salt Lake City (WGU headquarters). One meeting is devoted almost entirely to long-term strategy and another to reviewing short-term strategy and the University budget. In addition to the Board of Trustees, WGU also has a National Advisory Board (NAB) of twenty key corporate partners who contribute funding and technology to the institution. The NAB meets with the Board of Trustees to help set strategy and provide guidance and direction for the University.

In order to demonstrate the success of its competency-based learning model, WGU has developed and sustained a culture of performance by carefully measuring and tracking key metrics. In particular, the Board of Trustees measures institutional productivity by revenue per employee, number of students per employee, the marketing cost for each new student, and the cost to a student of a degree program. The Board also holds the University accountable for learner and learning productivity on a variety of measures, most of which are measured on a monthly basis, including student retention, the percentage of students making Satisfactory Academic Progress, student satisfaction, graduation rates, time to graduation, and both graduate and employer satisfaction. These key metrics allow WGU and its Board of Trustees to plan future strategies based on outcomes rather than traditional input measures.

#### **G. Outside-In Question Box 2**

1. Does the outside-in learning productivity agenda translate, in context, to issues and goals facing your institution? If so, would learning productivity be similarly formulated in your context?
2. Did you recognize similarities and possibilities for your institution in any of the profiles in productivity sketched above?
3. How is ICT providing leverage for high-priority, strategic, measurable goals (outcomes)?
4. If it is not, then is ICT at least a tactical, inside-satisficing cost at your institution? Do you need help with balancing ICT's cost with the levels of faculty and student satisfaction provided by ICT?

#### **IV. Education Is a Paradoxical Priority – Both a Solution and a Problem**

*Freedom's just another word for nothin' left to lose.*

... Kris Kristofferson (circa the late 1960s)

Most college-educated people, including most political leaders and policy makers, believe education is the key to resolving the major crises facing modern civilization, including the eternal tension between the powerful and the powerless in its many manifestations. What is not well understood, however, is the paradox that education today can be both a “solution” (based on the strategic leverage of ICT) and also a crisis-level problem (if the leverage of ICT is not captured at institutional and inter-institutional scale to improve the productivity of the education enterprise). Several lines of inquiry support this ambiguity about the priority of education.

#### **A. The Complexity of Connectedness**

Everything is connected to everything else, and the resulting complexities imperil the sustainability of modern civilization. For example, four macro-level “E” crises – of ecosystem, economy, equity,

and education – occupy the attention of informed public debate around the world and, in the U.S., have been both emphasized and interconnected in President Obama’s speeches and stimulus/budget packages.

Ecosystem: Every micro-ecosystem is connected to every other in the global macro-ecosystem. The phrase “climate change” has replaced the more threatening “global warming” in the political lexicon. National surveys (in the U.S.) nevertheless reveal that college-educated people align with today’s scientific near unanimity that the “hockey-stick” global warming curve is a trend. Whether it is a long-term trend or not, most educated people expect government not to bet against human activity as a contributor to the global warming trend. They instead expect government to mitigate human-causation risks with science-informed policies and investments in education and research and to take on ecosystem issues related not only to global warming, but to water rights, agriculture, toxic wastes, etc.

Economy: In the global macro-economy every modern geopolitical micro-economy is connected to every other via the global Internet of private and public networks. The resulting immediacy of access to financial information and self-service transactions recently revealed an imperiling global downside. As the health of the U.S. economy deteriorated sharply in 2008, the infection spread to other economies, resulting in a global downward spiral as the virtual global financial feedback system turned bad news into worse news on a 365 x 24 basis. Declining trust in the U.S. economy spread virally and was amplified throughout the global virtual market of complex financial instruments and frictionless transactions.

Equity: The modern world has the capacity to make unprecedented opportunities available to individual option, but requires globally coordinated “rules of the road” to permit the universal individual exercise of options for pursuing equal opportunity and the happiness and security it can bring to individuals and nations. This paradox that pits the private good against the common good is captured (in U.S. terms) in the political philosophy that all people are created equal and free to pursue happiness on a competitive playing field – one that requires a rule of law to ensure fair play. With rights come responsibilities, or, in the afore-cited words of songwriter Kris Kristofferson, “freedom’s just another word for nothin’ left to lose.” Too much social equity can lead to irresponsibility and anarchy, and, yes, to bad times when markets are too free, or to inequity when law grants already powerful corporations and governments more rights than individuals. Too little social equity often results from various forms of autocracy or statism and leads to poverty and even revolution, but, yes, under “benevolent” governments may also lead to improved economic conditions for the governed. The perversely inverse relationship between equity and inequity – that too much of one can lead to the other – makes neither a desirable absolute. In spite of ongoing social equity crises springing from human inhumanity, the arrow of history points favorably toward political philosophies and practices that favor the social equity that depends so much on education, especially on tertiary education, in the modern world.

Education: Education’s claim on priority is that it is the basis for learning how everything and everyone are interconnected and how to mitigate any resulting complexities and disputes.

Themselves interconnected, the preceding three “E” crises arise from increasing complexity and connectedness in nature, in the human condition, and through digital technologies. The need to mitigate and manage these crises is increasing worldwide demand for intellectual capital, which is derived today primarily from the global, collective education enterprise. Education is *both* a private good and a common good. In all modern contexts, education is now the primary vehicle for practicing the principle of social equity (by enabling equal opportunity) and for assuring collective socio-economic security and insuring against its collapse. Tertiary education and continuing education, moreover, have become the necessary means to pursue *ongoing* individual opportunity, the *greatest* geopolitical economic advantage, and the *most solid* foundation for long-term socio-economic security – thus, the brains race. In any context in which, for example, a richness of natural resources or an external global demand for unskilled labor cannot sustain long-term economic advantage, tertiary-level skills are in high demand, especially in STEM. Most modern governments accordingly recognize that both the private good and common socio-economic good depend on universally accessible individual educational opportunity and focused government investments at all levels of education. Simply stated, more people worldwide require more education over their lifetimes in order to secure socio-economic security for themselves, their families, their employers, their governments, and our civilization. The current education enterprise of randomly connected investments, organizations, and processes, however, is struggling to meet the increasing demand for intellectual capital. Education, as a critical subsystem of modern civilization, is thus challenged in its capacity, scalability, and affordability, even as it continues at sub-scale to advance the knowledge and educate the expertise required to mitigate and manage civilization’s three other “E” crises.

Educational opportunity is not the end game. The learning productivity agenda (II.D) implies that 1) education be marketed to create demand for learning credentials targeting specific civic and economic security needs, present and future, 2) education capacity, access, and pricing be managed according to such needs, and 3) student success in such credentialing programs be assured. The education marketplace, today driven by an inside-out supply of educational opportunities, will have to become more responsive in meeting outside-in demand for assured education. In short, the education marketplace needs to be more a market than a club.

## **B. Want Free Education? Then Free Education!**

The repeated phrase “free education” in the above heading is intended to convey two different issues. The first asks whether education should be free – i.e., a publicly funded entitlement. The second asserts that the path towards freer education is first to free education from various externalities and internalities that constrain it. Education is already an entitlement in many geopolitical contexts, but not in all. Even tertiary education has been a near-entitlement administered at a central ministerial level in many nations, but the public affordability of that socio-economic value proposition is unraveling rapidly.

In the U.S. where public tertiary education is largely funded state by state, many states have attempted to make education at all levels as free as practicable. The North Carolina constitution, for example, provides “by taxation and otherwise for a general and uniform system of free public

schools” and further mandates that “the benefits of The University of North Carolina and other public institutions of higher education, as far as practicable, be extended to the people of the State free of expense.” The devil is in the detail of merging the phrases “as far as practicable” and “free of expense.” For example, public colleges and universities, including those in North Carolina, are arguing for increased per-student state subsidies while policy makers, drowning in steep per-capita declines in tax revenues, are reducing per-student subsidies and asking the statewide public tertiary education enterprise to produce more credentials at lower per-credential expense to the state and its citizens. The service delivery model underpinning today’s educational enterprise was not predicated on the need to scale educational opportunity to the levels required to compete geopolitically in the hyper-competitive global economy and its attendant brains race, and that is why education can both enable solutions to civilization’s crises, while also moving toward a state of crisis itself.

### **C. Into the Learning Cloud**

The process of increasing learning productivity in the education enterprise is the path toward a freer (more open) expansionary education marketplace with competitive options for how accountably credentialed learning opportunities are found, accessed, delivered, accountably assured, and afforded privately and publicly as the means to meet the complex, inter-dependent crises of ecosystem, economy, and equity challenging the sustainability of civilization in the 21st century. A more productive, open education marketplace will better balance public and private investments in education to make organized learning as free as practicable to all of its investors and beneficiaries. The time is right to understand why and how the education enterprise should participate in globalization and use the leverage of ICT, especially of the cloud, to restructure its business and access models in order to evolve an open-market learning cloud to help increase and meet the demand for life-long learning.

## **V. The Conflation of Globalization, Innovation, Productivity, and Technology**

*You can be on the right track and still be run over.*

... Will Rogers

New technologies always present new opportunities and challenges. At first, the opportunities are not well understood in the context of then current artifacts, behaviors, and organizational and service models. Technologies accordingly are bolted onto existing practices and processes. Later, typically after dizzying levels of adoption, the maturing technology challenges us with the recognition of what we should have foreseen and done differently. A brief historical perspective on a not-so-new technology will illustrate this hindsight concept and, then, will be followed by some comments on what we should have foreseen about the technology (ICT) that is presently an integral part of the fabric of a fast-changing modern existence.

### **A. A Brief History of Technology**

Consider the following encapsulated and whimsically scripted 100+ year history of the combustion-engine automobile that is so familiar today:

Kay: A horseless carriage? But I love my horse and carriage!  
Ken: Put your horse in the back seat of the horseless carriage, and let's go!  
Kay: Go where?  
Ken: Oh! OK, I'll build some streets. Meet me at noon tomorrow at Hollywood and Vine.  
Kay: Why is the air here in LA so brown at noon?  
Ken: Carbon, I'm told. But, please, board this tofu-powered carbon-free train, and let's go!  
Kay: But I thought you planned to drive us.  
Ken: Yes, but I can't afford the gas! Plus, don't want to risk arrest by the carbon troopers.

Fast forward to the introduction of the IBM PC circa 1981. A few years later in 1994, a study by the National Research Council revealed that the new individual productivity platform – now, by the way, no longer manufactured by IBM – had not yet improved productivity in the service economy (Information Technology in the Service Society: A Twenty-First Century Lever 1994). It had, however, catalyzed new consumer offerings that would not otherwise be viable – word processors, spreadsheets, etc. A few years later a number of new reports confirmed that, not the PC alone, but integrated ICT had begun to drive productivity in the service economy. Along the way, the Internet became the road for those who drive consumer computers and other smart devices to connect to other people and digital information resources. Venerable “ways of doing business” – business models – were soon eviscerated, damaged, or commoditized. Encyclopedia Britannica capsized in the wake of Google (even before Wikipedia was introduced). New services with fundamentally new underlying business models proliferated, some successfully and some not. Information and communication technology was on its way to becoming the accelerator of productivity on a massive scale – the phenomenon of globalization! Then the global economy tanked, after the “smartest guys” in the financial-services room binged on the opportunities for chicanery inherent in largely unregulated nano-second access to digital financial information and transactions – and demonstrated their aversion to risk aversion.

A readable, popular account of the globalization phenomenon is Thomas Friedman's “flat world” book (Friedman 2007). Friedman recognizes that globalization is the result of the competitive quest for productivity improvements and business survival. He extracts from case studies the eight underlying ICT-enabled external sourcing (and partnering) strategies that have driven productivity and, thus, globalization – *in-sourcing*, *out-sourcing*, *open-sourcing*, *off-shoring*, *supply-chaining*, *work-flowing*, *in-forming*, and *steroid-ing*. Friedman's examples are fast-forward updates on a much earlier 20th century theory of the “firm,” a theory that could have predicted many of the basic features of globalization – if only foresight could have first predicted the development of silicon-based transistors, microprocessors, and the Internet.

Writing in the 1930s about the balance between internal sourcing and external sourcing, 1991 Nobel Laureate in Economics Ronald Coase described “hidden transaction costs” in rationalizing why companies may not externally source some functions that would be logical candidates for improving overall success while limiting growth in the employee base (Coase 1937). Not sourcing externally

has a clear downside in the potential loss of core focus and the absence of best-of-breed external expertise in non-core functions. Organizations tend to become overly bureaucratic and inwardly focused as they divert attention from their core product/service offerings (arising from core expertise) in order to develop and manage internally the vertical functions required to enable and support the success of core product/service offerings.

Consider, for example, tertiary education where core expertise resides in a learned intellectual capital base. In a civilization in dire need of instilling tertiary-level learning and learning skills in an increasing proportion of the global population, how should the world's intellectual capital base be organized for maximum leverage? A deeper dig uncovers two questions: 1) how best to organize and manage the skills required to expand, integrate, disseminate, and preserve knowledge, and 2) how best to provide the trust function of credentialing knowledge acquisition by learners – from apprentice learners to the guild-level learners who will replenish the intellectual capital base at the core of tertiary education. These two core questions have gone largely unasked for years, but deserve timely consideration as the learning productivity crisis begins to wash over the current tertiary education enterprise based on classrooms, credit hours, libraries, internally conferred credentials, and so on. Even if the core business model for tertiary education remains in its current state – a sure bet in the medium term – the business model could benefit from more mundane (outside-the-core) external sourcing and partnering opportunities, such as those represented by cafeterias, bookstores, facilities and grounds management, marketing, recruiting, admissions, registrar functions, enrollment management, financial aid, institutional research, grants management, central ICT or some of its functions, and many other functional areas.

The internet preceded the Web, but the Web is itself an Internet-enabled innovation that daily spawns new services and business models and enables the redesign of others. This is indeed an age of accelerated change in the service economy and its underlying business models, except in the health care and education sectors. The governance and service models for the education enterprise are characterized, at best, by randomly interconnected interests, investments, organizations, and processes – not only around the world, but also and too often, for example, even within a single state in the U.S. The cradle-to-grave life-long learning pipeline is not well positioned to increase the proportion of the population holding tertiary credentials. To make matters worse, the pipeline is leaky and not seamlessly connected at its various age and attainment junctures. The pipeline is both a cause and an effect of the learning productivity crisis. Where does ICT fit into this picture? Everywhere, unless there is something wrong with engaged learning among an expanding group of learners, all enabled via affordable high-tech/high-touch strategies that were heretofore unimaginable.

There is little consensus for change among education insiders. Education has been on the right track for a long time but may soon be “run over” by the accelerating train of globalization. It's time to get education right to ensure that globalization is running on the right track. We owe it to the future.

## B. The “Strategicness” of ICT in Education

ICT is a necessary expense in education, but seldom takes on the characteristics of a strategic investment. ICT becomes a strategic investment only when education leaders risk their traditional professional currency by leading an effort to tap ICT’s proven leverage for increasing learning productivity. Measurably improving performance at scale in the most strategic areas of the education enterprise, including its expense structures, requires selectively foregoing some of the traditionally scheduled face-to-face interactions that are too often neither engaging nor efficient. ICT enables efficient and conveniently accessible high-tech online (asynchronous) self-service learning and learner support, but the social nature of learning argues also for providing as-needed individualized high-touch assistance as conveniently and efficiently as possible – though not necessarily face to face.

For the most part, ICT remains today what 1978 economics Nobel Laureate Herbert Simon called a “satisficing” expense, one that in tertiary education, for example, is necessary to the satisfaction and everyday activities of the faculty and the students, but not yet strategic to the enterprise (“satisfice”). The taxonomy of ICT-enabled productivity has three tiers in the education enterprise. The first tier “satisfices” instructors and students, while the next two, more strategic tiers require cultural changes that may be disquieting, rather than satisficing.

1. Individual productivity: Education leaders understand the role of ICT in the individual productivity of students, teachers, professors, staff members, alums, board members, and so on. Of course, ICT is ever changing and, with it, the nature of the productivity tools available to individual option – including Epsilon, Facebook, Second Life, Twitter, and others in the cloud. Improving everyday individual productivity, academic and otherwise, is nevertheless a well-established ICT-enabled goal reflected in baseline application and infrastructure investments and added-value professional development services and student-satisfaction services.
2. Information productivity: Education leaders recognize the need to improve access to and the accuracy of enterprise information as a key to creating a culture of evidence and accountability. They know that cultural resistance typically stymies the effective use of new reporting and analytics systems, and only sporadically have they been able to synchronize culture and ICT-enabled business-intelligence tools to analyze, synthesize, and act on the educational models and processes that affect learning productivity. This latter process has been called “action analytics,” which combines transparent, accurate accountability reporting with predictive modeling and ICT-enabled interventions to improve outcomes (Norris, et al. 2008).
3. Learning productivity: Education leaders seldom reflect on the ramifications for education of the productivity drivers inherent in globalization – an analogy in which ICT-enabled business intelligence, process redesign, and innovation have proven to be the primary tool sets available to improve productivity and competitiveness at scale. Pressures on education chief executives to improve upon and account for learning productivity are mounting, but too few connect the dots and proceed to relieve the pressures using ICT’s enabling role in increasing productivity.

# Culture and Productivity



One of the challenges in finding a strategic role for ICT in education is to move beyond the mind-set that the educational use of ICT is about “putting everything online” in order to spend less on instructors and staff. Not so; instead, it’s about the flex concept – about balancing high-tech (asynchronous) self-service with as-needed high-touch, individualized assistance at the convenience of the learner. The end game is to increase the convenience of access where there is demand, while assuring appropriate learning outcomes at more favorable per-credential costs.

## C. Outside-In Question Box 3

1. Where is your institution in the above three-point hierarchy of ICT productivity types?
2. Do you use and have access to key operational and longitudinal performance indicators to guide and track your institution’s highest-priority strategic objectives?
3. Is your ICT organization well led and managed? Have its service costs been benchmarked? Do you track its role in supporting learning productivity?

## D. High Touch and High Tech Are Not Antithetical, Even in the Cloud

Credentialed education will continue to be a high-touch enterprise. Education exists, after all, not only to credential learning, but also because most apprentice learners cannot learn and learn to learn without engaging with mentors and other learners. Many learners find it especially difficult to connect theory to practice and to connect the dots between the branches of knowledge – even when the world’s histories, cultures, and knowledge repositories can be “googled” on demand for

study and assistance. A colleague, Jim Noblitt, observed that sending learners to the Web to learn to learn without structured help is akin to locking them alone in the library to become self-educated. Learning is both a solitary and an integrative, high-touch activity! High touch and high tech need not be antithetical, however, and the success of the 2008 Obama campaign strategy illustrates the point and, by analogy, challenges traditional thinking about how to create and scale learning communities that draw on the energy and wisdom of a crowd of learners, as well as the teachings of a “master.”

President Obama and his campaign team have utilized the latest collaboration and social networking tools, data tracking tools, and trend discovery and analysis tools to:

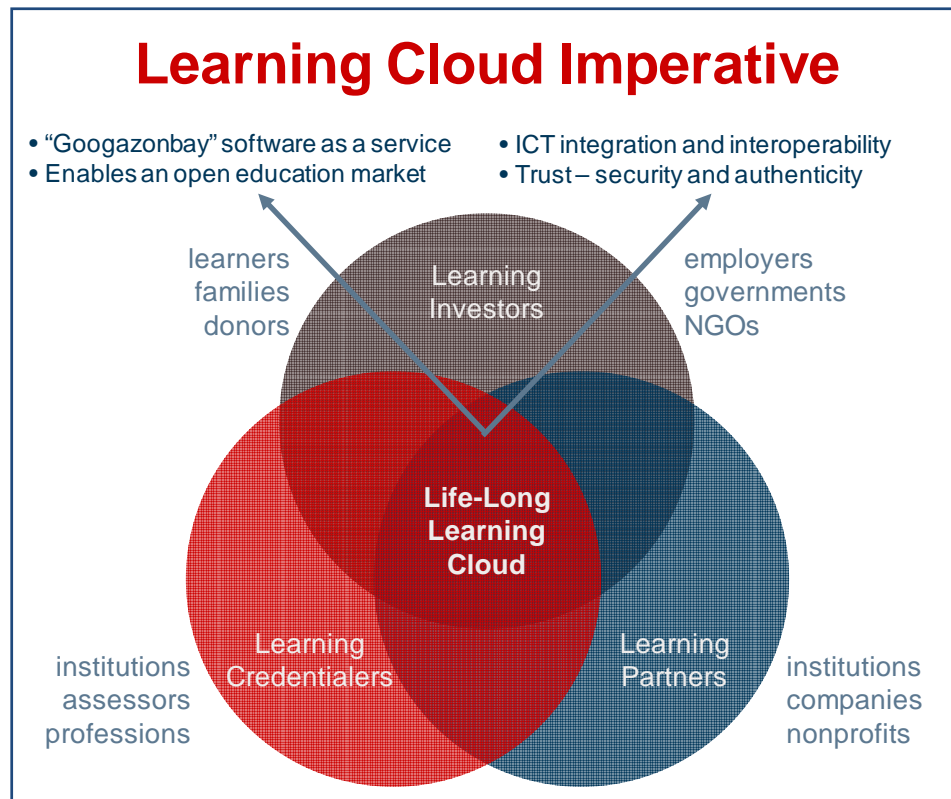
- Mobilize an engaging, fluid dialogue about national policy and the nation’s future, both in the U.S. and abroad.
- Inform and listen to the electorate.
- Continue (now as part of his governance model) to mobilize and involve “ordinary people” in support of the policies and politics of his administration.

The campaign’s “business model” depended on the scalability and efficiencies inherent in the “**cloud**” – the Web-accessible mesh of individuals and organizations, all functioning virtually through nodes on the Internet network of networks to offer “software-as-service” applications and the convenient communication and transactional opportunities they enable. In the opt-in/opt-out cloud, basic human communications and resource exchanges can become, by design, broadly and mutually affordable – by optimizing for high-tech self-service that is backed up by high-touch, nearly on-demand assistance from the “wisdom of the crowd” of participating collaborators.

Those who use Google, Amazon, eBay, Facebook, Twitter, or YouTube have been in the cloud. Google’s search function is free and is provided by ICT investments not made and managed by you or your organization. Google “lives” in the cloud. Amazon is a “big-box” consumer marketplace in the cloud. After but one convenient online transaction with Amazon, further communication about products that might interest the buyer is inevitable – and usually welcome. Education would also do well to intervene with a learner based on what is already known about the learner’s educational interests and progress to date. Education would further do well to understand how seamlessly buyers and sellers find each other in eBay’s open market in the cloud, a marketplace that operates with little regulation other than eBay’s virtual trust mechanism, which ostracizes dishonesty equally on each side of the buyer-seller equation. Social networking applications Facebook and Twitter provide a private, virtual place in the cloud to stay in high touch with an invited circle of adaptively or natively high-tech friends.

Indeed, the cloud has become both the content and the global community of virtual communities among digital natives and digital “immigrants.” Just as “team Obama” is using the cloud as leverage for enabling engaged citizenship at scale, so should “team education” learn to use the cloud as leverage for engaged learning at scale. Team education also could be “working the cloud” at this moment of economic uncertainty to earn the active involvement of the myriad constituencies whose critical support for tertiary education for several years now has waned as tuitions waxed and

performance waned. Let's build a **learning cloud** to attract and support a **learning crowd**! Perhaps learning productivity should be the modern world's next Peace Corp-like challenge.



## VI. ICT-Enabled Strategies for Increasing Learning Productivity

Over the past 10-15 years, three ICT-enabled strategies for improving learning productivity have emerged. Applied in context and in various combinations, they can help the tertiary-education enterprise resolve the learning productivity crisis.

### A. External Sourcing/Partnering Strategy

***Focus internally on unique academic program strengths, while externally sourcing or partnering for other functions in order to improve quality, nimbleness, and capacity while simultaneously reducing unit costs (per-FTE costs, for example).***

Friedman identifies eight “flattening forces” that derive from using ICT to redesign organizational structures, service processes, and business models (Friedman 2007). His labels for these productivity-increasing, ICT-enabled external sourcing and partnering models are listed below, along with examples to illustrate the tertiary-education possibilities:

- ***Out-sourcing*** – as in externally sourcing a 365 x 24 technical help desk or online “coaching” service for all students, or cloud-sourcing student email from Google.
- ***In-sourcing*** – as in externally sourcing a cabinet-level leader to be responsible for internal planning and decision-making processes in a key functional area requiring state-of-the-art

knowledge and experience, such as enrollment management, or central ICT where an externally sourced expert CIO can serve as a cabinet member and lead and manage central ICT staffing and service delivery

- *Work-flowing* – as in using ICT to redesign, streamline, and track, for example, the work-flow processes involved in institutional performance reporting and analytics, enrollment management, institutional grant proposal and management, or financial aid.
- *Supply-chaining* – as in externally sourcing marketing and student recruitment.
- *Open-sourcing* – as in participating in an open-learning collaborative, or in joining a community-sourced application software collaborative while also externally sourcing the application’s ongoing support.
- *Off-shoring* – as in contracting for the online delivery via “off-shore” adjuncts of teaching or tutoring services in baseline mathematics and other STEM introductory content areas.
- *In-forming* – as in encouraging the use of search engines for research and in externally sourcing online informational and learning resources (content, courses, programs, benchmarking data, etc.) from external partners for the benefit of the institution and its students.
- *Steroid-ing* – as in migrating as many institutional services and alerts as possible to the student-owned mobile devices that, *à la* McLuhan, have become part of the latest generation’s communication and behavioral modalities.

## B. Flex Program/Service Redesign Strategy

***Use ICT to optimize high-tech online asynchronous self-service learning in credentialing programs and learner-support services, while also providing as-needed, individualized high-touch expert student-service and learning assistance, whether face-to-face or through toll-free or ICT-mediated centers.***

Many would refer to this ***flex redesign strategy*** (already cited in II.F.2 and II.f.6.c) in terms of “online” or “distance” programs and services. Others might find the terms “blended” or “hybrid” implied by the description of the strategy. All of these familiar labels, however, are somewhat misleading. Distance certainly can be a barrier to access, but programs and services requiring inflexibly scheduled real-time human interactions are often a formidable barrier to access, even when distance is not.

Flex programs and services can not only increase the ***convenience of access*** to education, but also improve the ***affordability of access*** for learners by eliminating or reducing the expense of taking time off from a job or a family or from relocating or commuting on a regular basis to a campus. When applied to credential programs and their necessary student support services, the flex strategy succeeds by honoring three core premises.

1. ***Convenience matters!*** All students today expect a blend of high-tech and high-touch instruction and support services. Optimizing for anytime (asynchronous) self-service,

however, not only provides the convenience factor valued by all students, but extends it as far as the individual student's learning and comfort levels permit, thereby substantially redirecting traditional contact-hour labor to high-touch individualized interactions on an as-needed basis. The individually optimized complementarities of high-tech self-service and high-touch assistance set "flex" programming apart from "blended" and "hybrid" programming, and make flex programs attractive to students for whom the convenience of access to education is paramount to their circumstances or preferences. Individualized (high-touch) services can include a 365 x 24 technical help desk and a number of other toll-free services, along with business-hours or office-hours walk-in support and various forms of individualized synchronous and nearly synchronous online support. "Flex" is the concept of meeting all of these high-touch needs while still maximizing self-service opportunities. In this sense, "flex" can mean entirely online, but need not. Even the students who purposively choose a residential academic experience appreciate the convenience of online (asynchronous) self-service and the availability of individualized assistance when needed.

2. ***Instructors and discussions matter!*** Few students can learn without guidance from content experts (faculty members and other instructors). That's why institutions invest in a faculty, rather than investing only in a library and sending all students to the library, virtual or physical, to "self-acquire" their education. Students also need the services of librarians, advisors, and others who help with the learning specifics at hand. The goal is an integrative learning and student-service context in which formal learning can be situated, in part, to promote social learning through give-and-take discussions. That goal can be accomplished through flex programming, as well as through traditional programming, and should be central to the flex redesign strategy.
3. ***Market needs and preferences matters!*** Public institutions typically have mission obligations not only to support educational access as a societal and individual good, but also to help meet various economic and workforce/professional educational goals established by charter or policy (program accountability as in II.E). Private institutions, in contrast, are relatively free to select the various credentialing and geographical markets in which they compete. To the extent to which they are tuition dependent, both private and public institutions should offer programs on the realistic basis of research into the program delivery characteristics preferred by specific markets. Such research often points to the need or preference for flex programming. With that in mind, one strategy is to plan as though all student services and selected credential programs must be delivered entirely online (asynchronously) to students who cannot come to campus or otherwise participate in regularly scheduled real-time interactions. The program can then be tailored to accommodate any necessary high-touch instruction and/or any less stringent delivery preferences that do not dictate the need for a totally online experience. For example, the quarterly residencies cited in the Antioch University profile in productivity (III.C) are a both an occasional inconvenience and a cost factor for students, but that has not hampered the success of the program. Even traditional residential, coming-of-age tertiary education may

soon have to be delivered within the convenience characteristics of flex programming to achieve market success among students who prefer to communicate and learn in the cloud.

### C. Universal-Curriculum Redesign Strategy

***Use ICT to redesign selected high-enrollment courses for both measurably improved learning and reduced per-credit costs – by following the course redesign strategies and models pioneered by the National Center for Academic Transformation (NCAT) and its client partners (Twigg).***

“Universal curriculum” refers to any cluster of high-enrollment courses that is critical to the productivity of almost all tertiary (or secondary) education providers. The courses in such clusters are 1) taught *universally* (by almost all institutions), and 2) attract high enrollments because they are either required by a credentialing program or are popular electives within such a program. In U.S. tertiary education, such courses can include high-enrollment general education courses, developmental courses, introductory courses in accounting and marketing in the business curriculum, and similarly required courses in other popular professional or workforce majors such as nursing, journalism, education, and so on. Clusters of such courses present significant capacity, enrollment management, and operating expense issues that can diminish or enhance overall learning productivity

To identify and redesign universal-curriculum course clusters, proceed as follows:

1. Start with the relevant course catalog – i.e., the overall catalog or a more specific, high-enrollment program catalog) and list all courses in descending order of their enrollments (aggregated across all course sections).
2. Pause when the list’s accumulating enrollment count first totals in the range of 40-50 percent of all enrollments.
3. Notice that the resulting list features a handful of courses – likely in the range of 20-30 courses, in the case of the overall course catalog. Such tertiary courses, for example, are taught universally in almost all tertiary programs across the U.S. and elsewhere.
4. Analyze and prioritize these courses for their possible impacts on student success. For example, identify courses with negative impact on retention and credentialing rates. Adjust the list to ensure that a significant subtotal of pertinent total enrollments is accounted for in the cluster of courses selected for redesign.
5. Use the ICT-enabled strategies pioneered by the NCAT to redesign (with administrative and teacher/professor involvement) a single version of each of the highest priority courses. The purpose of each such redesign is a measurable improvement in learning outcomes accompanied by a reduction in per-enrollment expenses.
6. After piloting and adjusting a new, single version of each course, replace all of its previous versions/sections with the new course.

*Those who make a distinction between education and entertainment don’t know the first thing about either.*

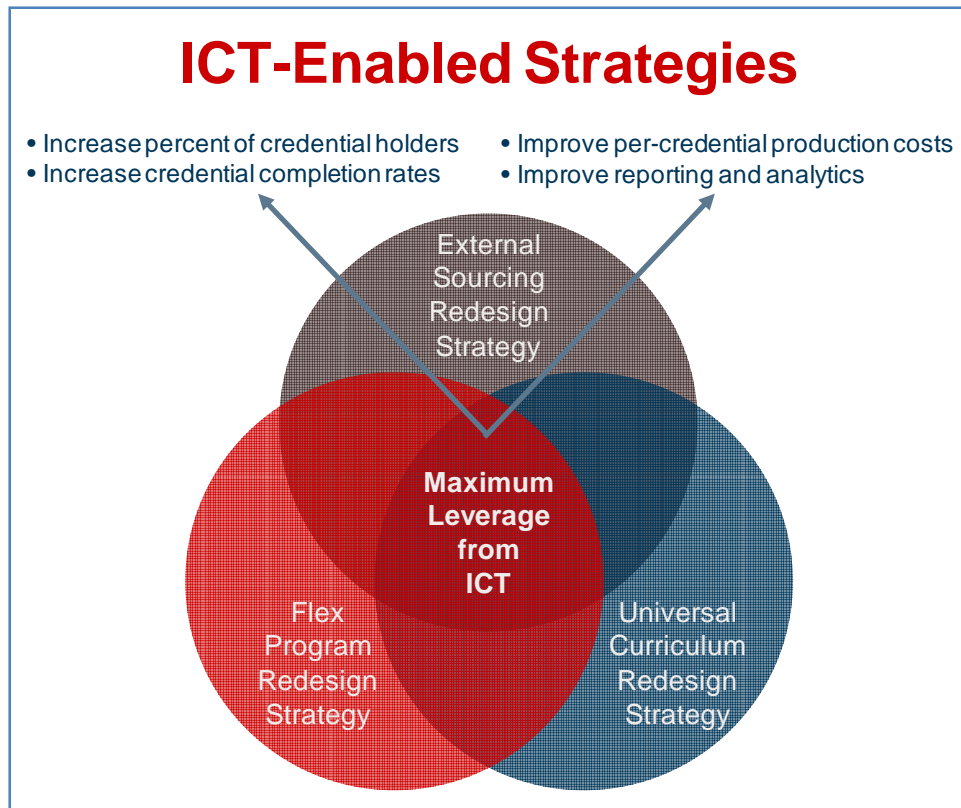
... Marshall McLuhan

McLuhan surely meant that effective education, like effective entertainment, stimulates interest and engages the mind. Engaging, active learning is at the center of the NCAT's course-redesign models for improve learning and financial outcomes. Over the past seven years, dozens of colleges and universities in the U.S. have worked with support from the NCAT to demonstrate conclusively that the ICT-enabled redesign of faculty labor can be focused on student engagement and the measurable improvement of student learning, not only to improve student learning and student and faculty satisfaction, but also to reduce per-enrollment direct instructional and instructional support costs. In an initial multi-year demonstration project, 30 institutions selected and redesigned one high-enrollment course per institution, and collectively achieved an average 38 percent offset in enrollment expenses in the 30 courses. That average offset can translate into potential annual per-enrollment operating expense offsets of up to 10 percent when a meaningful cluster of high-enrollment courses are systemically redesigned. The NCAT course redesign strategy and its results can be further amplified when multiple campuses work together.

Although the universal-curriculum redesign strategy and its results are counterintuitive to the traditional academic mindset that associates quality increases with decreases in the student-to-instructor ratio, its results are undeniable. The time is right to focus the NCAT blend of high tech and high touch on universal curricula – in the U.S., specifically on the general-education cluster of the 20-30 highest enrollment introductory courses in the basic fluencies and content areas that are so central to mission goals of access and student success. A number of institutions are also applying the universal-curriculum redesign strategy to high-enrollment professional and workforce courses and to developmental courses (in support of retention and graduation).

The next section (on assessment) will reveal how independent, normative assessments that address the goals of general education can be deployed to fortify already excellent results from the universal-curriculum redesign strategy. The converse, that the results of such assessments can be improved by the universal-curriculum redesign strategy, is already clear from the above discussion.

Various combinations of the three overlapping technology-enabled redesign strategies can be used to greatest effect in the U.S., for example, in statewide collaborative efforts by systems and other consortia. Indeed, unless these strategies are incorporated into the eleven "Making Opportunity Affordable" statewide planning efforts supported by the Lumina Foundation, the MOA "movement" is not likely to reach meaningful productivity goals (Lumina-MOA). That's not to say that other efforts, such as statewide policy audits and changes, will not also be essential to success. In any case, the "MOA Process" is the closest U.S. cousin to Europe's Bologna Process, and the Lumina Foundation and the eleven MOA states it is supporting deserve gratitude for their investments of time and resources in the future of tertiary education in the U.S.



#### D. Outside-In Question Box 4

1. Is your institution engaged in external sourcing or partnering? If so, how do you measure the success of the effort(s)?
2. Does your institution have flex credentialing programs? Are they successful? If not, why not?
3. Has your institution applied universal-curriculum redesign to any of its high-enrollment courses? If so, with what results?

### VII. The Assessment Iceberg – Because Learning Is Difficult to Assess, Assess No Learning?

The iceberg metaphor is only a device for flagging the difficulties created over the past 5-10 years as the socio-economic compact between the public and the education enterprise unraveled under the combined pressures of 1) increased demand for education to assure economic security and competitiveness and 2) globalization processes that have increased productivity in almost all economic sectors – education and health care being glaring exceptions. The icebergs discussed in this and subsequent sections are independent of geopolitical context, but are documented in U.S. terms in the belief that similar documentation is available in other geopolitical contexts. Notice that much of the documentation signals that a new social compact between the public and the education enterprise is already in the making – certainly in the U.S.

Here “assessment” refers to *summative* (after the fact) assessments of student learning outcomes. There is certainly a place for *formative* assessments which tend to focus on teaching, learning, and

support processes to identify process improvements having the potential to improve student-success outcomes. Indeed, perhaps the longest-standing and most successful formative assessment project in U.S. tertiary education is conducted under the aegis of the Council of Independent Colleges (CIC). Since 2005, more than 30 CIC member institutions have participated in the CIC/CLA Consortium and are using the CLA (Collegiate Learning Assessment) to assess “value-added” learning and, more importantly, to learn more about the cognitive growth of their students (Ekman 2008). The Consortium “has demonstrated through practice that the CLA (as an independent, direct assessment of student learning) is an appropriate means to assess an institution’s value-added contribution to learning over the course of a student’s undergraduate education.” Two other formative assessment opportunities are in broad use in the U.S. as survey processes, not for directly assessing student learning, but for indirectly gauging student engagement (NSSE), (CCSSE).

Now, back to summative assessments and what is not happening. The recent report, “New Leadership for Student Learning and Accountability,” advises U.S. tertiary education on learning assessment principles as follows (AAC&U/CHEA 2008):

*Each college and university (and major divisions, schools, and programs within them) should develop ambitious, specific, and clearly stated goals for student learning appropriate to its mission, resources, tradition, student body, and community setting. ... While these educational goals will vary from institution to institution, they should include the enrichment of both individual lives and our democratic society as a whole through the study of science, social science, the humanities, and the arts. By setting clear and ambitious goals, each institution can determine and communicate how it can best contribute to the realization of the potential of all its students.*

The AAC&U/CHEA principles are fine as far as they go, but they appear to be closed to the possibility that there are a few universal learning domains in which external (independent) summative assessments are possible and desirable in the interest of peer benchmarking and transparent public reporting. Both the National Commission on Accountability in Higher Education and Secretary Spellings’ Commission on the Future of Higher Education called for outcomes accountability (SHEEO 2005), (Spellings 2006). The recently created National Institute for Learning Outcomes Assessment speaks to the need within the U.S. tertiary-education community to address learning outcome assessment *and* learning accountability reporting (NILOA). NILOA nevertheless offers no clear indication that it will encourage public benchmarking based on independent, constructivist, normative assessments. In contrast, budding public learning accountability efforts are described in some detail in “Ready to Assemble: A Model State Higher Education Accountability System” (Aldeman and Cary 2008). Some of these efforts are emanating from the states and others from presidential associations, such as UCAN developed by the National Association of Independent Colleges and Universities, and the Voluntary System of Accountability and its College Portrait jointly developed by the Association of Public and Land-grant Universities and the American Association of State Colleges and Universities (NAICU), (VSA). The VSA, in particular, includes the institution-centric strategy of statistically sampling first-year and last-year students for “value-added learning.” That strategy appears to typify the current trajectory in the U.S. on independently assessing basic fluencies and critical thinking skills. These budding learning accountability initiatives in the tertiary-education community in the U.S. are developing in spite of the prevailing

inside-out academic perspective on benchmarking learning, which is best captured by the idea that because not all learning can be assessed, no learning should be assessed and benchmarked. In contrast, a “satisficing” outside-in strategy for assessing and benchmarking selected learning competencies is outlined in the items that follow below.

#### **A. Outside-In Assessments: Learning-Centric, Learner-Centric, and Society-Centric**

At a policy level in the U.S., the summative assessment issue is not whether institutions should retain autonomy over their myriad degree offerings and overall operations, but whether there is a limited, but inter-institutional academic mission domain in which a common strategy for improving upon and accounting for student learning could be broadly adopted across most institutions. In other words, are there important but limited domains of universal academic programming in which institutional autonomy should be voluntarily trumped (within specified limits) by the common good, all in the interest of enterprise accountability and reporting on key indicators of student success? Yes, in three domains, two of which intersect the universal learning domain called “general education” in the U.S.

The general education that helps prepare learners to enroll in a disciplinary or professional program is an obvious target for collectively applying a flexible strategy to improve upon and publicly account for learning outcomes in a way that permits peer institutional comparisons and benefits students. Almost all colleges and universities, after all, share a mission priority commitment to the goals of general education and typically proclaim to:

- Instill basic fluencies (communication skills) and critical thinking skills as habits of mind and as the basis for life-long learning, informed citizenship, and personal fulfillment.
- Demand a pattern of required and elective general education courses, both to cultivate basic fluencies and critical thinking skills directly and also to practice them in disciplinary courses that form the foundation for further vocational and avocational learning (addressing the arts, humanities, physical/biological sciences, social/behavioral sciences, the professions, and the workplace).

In this universal context for a “general education,” it is reasonable from an outside-in longitudinal perspective to expect secondary and tertiary education to transition together toward a holistic assessment strategy that is more learning-centric, learner centric, and society-centric than institution-centric. Several basic principles form the foundation for such a strategy:

1. Decouple some part of general education testing from teachers and institutions. Learners will learn to embrace required opportunities to assess their “general learning” at various stages of learning accomplishment and learning maturity, provided that such assessments are developed and scored independent of specific teaching institutions and teachers and are available for a lifetime to the learner to share in a normative context with employers and others, solely at the learner’s option and all via an e-learning portfolio under the control of the learner.
2. Move away from multiple-choice assessments. Ensure that independent assessments of general learning require learners to construct and expose a meaningful proportion of their

“answers” – to the extent possible, through competency-based interrogatories. Such work, along with an overall assessment “score,” should be available to the learner’s e-portfolio via a verifiably authenticated process.

3. Support the institutions that support required independent assessments. Any shift from institution-centric assessment strategies to learner- and society-centric assessment strategies is certain to be culturally controversial in the education enterprise. From an outside-in policy perspective, however, it is a desirable shift in the context of the geopolitical brains race, a shift already recommended, for example, in the Spellings Report in the U.S. (Spellings 2006). Public funding for such a shift could easily be justified on the basis of providing support for those institutions and systems willing to act voluntarily on the ideas that follow in the next three subsections. The public funding idea is further described in an “education assurance consortium” that is defined in Section X.
4. Respect the autonomy of teaching and grading. Within prevailing practices, policies, and course-centric learning provision models, do nothing initially to abridge any current rights held by instructors to teach and assign grades in a course.

#### **B. Learner-Centric External Assessments of Basic Fluencies and Critical Thinking Skills**

The process described below is equally institution-centric *and* learner-centric. It requires all credential-seeking tertiary students to complete at least one nationally normative independent assessment and gives them lifetime access to the result(s) to be shared, solely at their discretion, with employers and others.

Externally developed and scored assessment suites of basic fluencies and critical thinking skills are available today. CAAP (from the ACT), CLA (from the Council for Aid to Education), GRE (from the ETS), and MAPP (from the ETS) are U.S. tertiary examples, some with secondary-level counterparts – see (ACT), (CAE), (ETS). Most have or could have the additional virtue of not relying solely on multiple-choice responses, instead requiring students to construct and expose some of their work.

With these or similar assessments in mind, any institution could:

1. Select one broadly normative independent assessment of basic fluencies and critical thinking skills.
2. Require every credential-seeking student, as a condition of earning a credential, to complete the assessment at some appropriate point in the path-to-credential.
3. Require for the credential, or not, a “passing” score determined at institutional discretion.
4. Provide the authenticated score to the student through a secure mechanism, preferably provided by the external assessment provider in a manner that can be authenticated via the student’s e-portfolio over a lifetime.
5. Make it possible, at a student’s discretion, to situate the score within any supported institutional or broader demographic groupings for the purpose of selectively sharing the results with family, employers, and others.
6. Benchmark (publicly) institutional mean and median percentile indicators (or other indicators) of basic fluencies and critical thinking skills against average peer-group

counterpart indicators selected from the pool of all other institutions using the same assessment or other assessments that have been correlated to the selected assessment via concordance studies (Concordance).

The line of thought outlined above, while an anathema in traditional academic circles, suggests only that institutions voluntarily take collective action on external (independent) assessments and then benchmark the common basic fluencies and critical thinking skills that their curricula are designed to habituate as the foundation for life-long learning. These basic fluencies and critical thinking skills are typically proclaimed to be necessary to informed citizenship – the basis for blending the individual “pursuit of happiness” with the individual and societal pursuit of civic and economic security and economic competitiveness.

### **C. Learner-Centric External Assessments of Nearly Universal Content**

At the heart of general education and professional/workforce education at the tertiary level is the general education curriculum almost universally offered in U.S. – and elsewhere. General education courses are often taught in multiple sections or large lecture halls from syllabi evidencing nearly identical content coverage and learning objectives. Any tertiary institution could proceed, as in the universal-curriculum redesign strategy (VI.C), to identify the most important cluster of these courses in terms of its subtotal enrollment percentage and retention issues. Then:

1. Select a group of external (independent) assessments to represent core general education objectives keyed to the selected courses and/or to admissions requirements.
  - a. Select a suite of these assessments – each assessment to require as much student-constructed-and-demonstrated work as is practical, in lieu of relying solely on multiple-choice responses. The assessments might be selected from, for example, a representative sample of the ACT’s various competency-based subject-matter assessments, the College Board’s AP exams, or from similar assessment suites provided by other organizations (ACT), (AP).
  - b. Require each credential-seeking student to select and complete a small number (perhaps 3 or 4) of assessments from the above suite and capture the results in institutional records.
  - c. Substitute, or not, these assessments and scores for the traditional final exam that they individually represent. Instructors could continue to assign course letter grades to their students and have the freedom to use or to ignore the results of the independent assessments, as they deem appropriate to the grading methodologies they have adopted within institutional policy.
2. Provide an electronically secure and authenticated record of the external assessment results to each student involved. These nationally recognized independent learning assessment scores or percentile rankings could “follow” students (to represent a substantive slice of their secondary-to-postsecondary general education experience) in their private life-long learning e-portfolios. Students could share (or not) their private data with employers, family, and others as they see fit.

3. Collaborate on the process outlined above, where applicable, to extend it to a system (or consortium) level and downward into secondary-level school systems (whenever a course has a secondary-level counterpart course and assessment).
  - a. System/consortium institutions could independently specify, for each assessed universal course, the minimum score or percentile for which credit will be awarded to an entering or transfer student. As an additional courtesy to students, that minimum could be translated into transfer-credit minima for other independent instruments assessing approximately the same content – an undertaking along the lines recently announced by two leading assessment providers (Concordance). This limited transfer-of-credit transparency would alleviate much of today’s clamor for more comprehensive transfer-of-credit protocols. Universal courses, after all, are the courses for which credit transfer arguably should be transparent, though at a level determined and openly published by the individual institutional member of a system or consortium.
  - b. Secondary and tertiary partners could use the same assessments at different levels of educational maturity and even share their counterpart courses, sometimes taught by tertiary instructors to secondary students, and vice versa. The resulting bridge between the two sectors, while not universally traversable, would have some broad and useful scaffolding for correcting current misalignments between secondary and tertiary education.
    - i. Secondary and tertiary institutions would have a small, manageable set of aggregate mean and median scores and percentile ratings to compare to counterpart metrics on a peer basis.
    - ii. They could establish common longitudinal learning accountability data elements at the student-record level across a considerable expanse of the secondary-to-tertiary student experience.
    - iii. They could include (or not) a student’s score or percentile ranking (and the counterpart internal and peer average metrics) alongside the corresponding universal course in the student’s e-portfolio transcript.
    - iv. They could accept (transparently) inter-sector and inter-institutional credit transfer, and consider team teaching to increase collective enrollment capacity in the single, redesigned course.

By systemically collaborating on the incorporation of external assessments and the redesign of universal courses, tertiary and secondary systems in and across states and nations could improve and account for learning in a way that has significance from a policy perspective while also improving statewide and national learning productivity and benchmarkable accountability. Indeed, the American Diploma Project and the Data Quality Campaign have mounted encouraging initiatives from within the secondary-education sector in the U.S. to establish curriculum standards at the college preparatory level and longitudinal data principles and standards for creating a more effective bridge between secondary and tertiary education (Achieve), (DQC).

#### **D. Low-Hanging Fruit: Assessments of Professional and Workforce Readiness**

Many professional and workforce careers are gated by assessments external to the tertiary institutions that “prepare” their practitioners. Examples of these assessments include Bar Exams in the U.S., Cisco’s worldwide certification programs, various certifications for health-care professionals and educators, and a myriad of others. Tertiary institutions should, and often do, track and publicly report the aggregated results from these gating assessments of the students they credentialed in pertinent professional and workforce programs.

Learning outcomes in other credentialing programs, such as a baccalaureate degree in history, are probably best left to the disciplinary or professional faculties that are responsible for such programs in each institution.

#### **E. Outside-In Question Box 5**

1. Is your institution/system a participant in the VSA or any other inside-out voluntary effort to address learning accountability via independent assessments (VSA)?
2. Is your institution/system positioned to engage the debate that would be raised by the outside-in independent-assessment concepts advocated above?

### **VIII. The Pipeline Iceberg – the Demographic “Otherhood” and Other Issues of Scale**

In defining learning productivity, policy expectations were expressed as a requirement to increase the proportion of tertiary credential holders in adult populations. Such increases, however, are dependent on the flow of learners into tertiary education and, so, are dependent on the life-long learning pipeline, from pre-puberty to a post-tertiary retirement age.

Population growth rates vary, but diversity is increasing in most geopolitical demographic profiles. Recruiting and admission strategies in tertiary education are already in various stages of embracing diversity and its many dimensions of “otherness” that are replacing “sameness” and leading to the redesign of enrollment management strategies within the core academic service models that determine learner success – and operating costs and, thus, pricing strategies. This new tertiary “otherhood” academically and financially translates into first-generation, underprepared, needy learners, and it is fast replacing the historical “majorityhood” of tertiary education demographics, however “majority” had been defined in the past.

Education must not only manage educational capacity to meet unmet employer demand – for credentialed nurses, teachers, and STEM professionals, for example – but also help create demand among students of all ages in the pipeline for credentials in these same areas. The latter is a marketing challenge. Pipeline issues are interconnected and complex!

Facing increasing geopolitical economic competition, policy makers are projecting the workforce proportions of tertiary credentials required for competitiveness. Their projections reflect labor and workforce statistics, but invariably are influenced by global, comparative data from the Organisation for Economic Co-operation and Development (OECD). OECD data reveal, for example, that the U.S. has

fallen behind other nations. The U.S. has fallen to 10th place in the percentage of tertiary-educated adults ages 25 to 34 – not an acceptable position in U.S. policy terms. The reaction has been swift. For example, Lumina Foundation's "Big Goal" is to increase the percentage of Americans with high-quality, two- or four-year college degrees and credentials from 39 percent to 60 percent by 2025, an increase of 23 million graduates above current rates (Big Goal). Another report, "Coming to Our Senses: Education and the American Future" from a commission of education leaders sponsored by the College Board, seeks to assure that "by the year 2025 fully 55 percent of young Americans (age 25 -34) are completing their schooling with a community college degree or higher" (Kirwan 2008). President Obama's related goal is the most ambitious of all: to increase the current 39 percent of tertiary credential holders in the 25-64 U.S. age group to 60 percent by 2020.

A simple computation will bring the pipeline iceberg into fuller view by revealing some of its implications from beneath the water's surface. Assume, for example, a steady-state proportion of adults in the U.S. 25-64 age group over the next 15 years – a simplifying but conservative assumption. Then increasing the tertiary credential-holding proportion from its current 39 percent to 60 percent would require compounded annual growth rates of about 3 percent and 5 percent over 15 and 10 years, respectively. Can such ambitious increases be achieved and, if so, how? This is a pipeline question with clear implications, not only for improving current tertiary credentialing rates, but for fixing the leaks in the life-long learning pipeline that constrain the flow of learners into tertiary education – secondary dropout rates and secondary-to-tertiary enrollment rates, for example. The 25+ age group of adults is also part of the pipeline flow into tertiary education and is a critical component. According to the U.S. Department of Education, adults of age 25+ will account for 38 percent of all enrollments in degree-granting tertiary institutions in 2010 (NCES). The aforementioned report from the College Board offers a comprehensive analysis of pipeline issues, along with recommendations for resolving them (Kirwan 2008).

The primary-to-secondary-to-tertiary pipeline in science, technology, engineering, and mathematics (STEM) can be, and has been, modeled by a group of Raytheon engineers employing Forrester's system dynamics approach. The model was developed under the aegis of the Business Higher Education Forum with the intention of better understanding the STEM pipeline in its various dimensions in the U.S. (BHEF). The model has since been refined to yield broader insights into college readiness and to help identify subsequent success factors for STEM-ready college students – those with both high interest in STEM and high proficiency in math. Raytheon has "gifted" the model to BHEF. In return, BHEF has made the model available as an open source tool by forming an open "collaboratory," the STEM Research and Modeling Network (SRMN). Not only does SRMN make the Raytheon model freely available to those want to use and/or refine it, but SRMN also hopes to stimulate similar modeling and simulation efforts on a broader basis through open collaboration within an inclusive community of educators, researchers, and policy makers. SRMN is open to anyone (who, for now, first registers with Google Groups). The SRMN model can expediently test adjustments to the current STEM education business/service model, and may ultimately become malleable enough to test alternative education business models more broadly. Even in its current form, the model can incorporate enough financial variables so that what-if interventions and changes in traditional secondary-to-tertiary STEM pipeline

practices can have an at-what-cost dimension. Over time, an evolving model might help determine whether the current education service/business model permits sustainable, affordable solutions to today's comprehensive set of education problems.

## **IX. The Economic Iceberg – Collisions in the Tertiary Education Economy**

### **A. Public Revenues**

Mostly ignored before the meltdown, but now recognized as a near certainty, is that public funding for higher education on a per-student basis will be under heavy downward pressure for the foreseeable future. Indeed, public funding may move from a per-student (per-FTE) basis to a per-credentialed basis, a trend that is in the nascent stage and that would be a natural consequence of the trends reported here. Consider some of the evidence, past and projected, for trends in per-student public funding.

State and local public subsidies: Even as the meltdown accelerates higher education's state funding problems, those problems have been transparently in the making for several years. For example, the State Higher Education Executive Officers published a report in 2006 noting that the national average of inflation-adjusted per-FTE state subsidies for public institutions had reached a 25-year low in 2005 (Lingenfelter 2006). The National Center for Public Policy and Higher Education also issued a report in 2006 projecting that by 2013 every state will be suffering a structural shortfall in tax revenues, which will not be sufficient to cover ongoing financial obligations (mandates) – such as Medicaid, K-12, and prisons – while also maintaining inflation-adjusted levels of then current spending on other priorities, such as higher education (D. S. Jones 2006). The 2013 projection from NCHEMS now appears to be coming to fruition early – possibly in 2009! Local tax support, which applies to numerous community colleges, is similarly stressed and likely only to deteriorate for the foreseeable future.

Federal subsidies: The Pell grant program, tuition tax credits, and a few other less significant federal programs provide important financial subsidies to higher education and its neediest and middle-class students. These programs, however, are stressed. The stresses on Pell grants, for example, are two-fold: 1) the cap on individual grants has not kept pace with spiraling tuition increases for some years now, and 2) the supply (the number of students being served by the program) does not meet the need-based demand (from students eligible for the program). After lobbying by higher education through the American Council on Education and a number of sector-specific presidential associations, these issues have been addressed in the Congressional response to President Obama's "stimulus proposal." Stimulus funding also will help states offset reductions in their public allocations to higher education forced by the economic downturn and statutory requirements to balance budgets. Increased federal funding, however, is not likely to offset the continuing long-term deterioration of state per-FTE funding. For example, even the proposal to "mandate" and increase the cap on Pell grants will still leave gaps in funding for the neediest students.

Student loans: Though student loans are not public revenues to higher education, many are guaranteed by the federal government (from public funds). More important, student loans are a

major component of net-tuition revenues for many schools. Several recent reports have noted considerable consolidation in the student-loan market, but have nevertheless claimed that there is no shortage of credit in the market. Qualifying for that credit and maintaining the resources necessary to repay it are the main issues facing students and their families and, therefore, also facing colleges and universities. No patterns have yet emerged, but schools, especially those that are tuition dependent, fear that credit may become unavailable or unaffordable to their neediest recruits and also eventually unaffordable to some enrolled students whose financial circumstances are deteriorating in the new economy. Further exacerbating the loan problem for students and their schools is an average debt load of approximately \$23,000 carried by borrowing students upon completing a baccalaureate credential (College-Board).

## **B. Endowments**

Two recent survey-based reports reveal that educational endowment investments began a downward spiral in the 2008 fiscal year, and accelerated downward in first half of 2009 (Commonfund 2009), (NACUBO 2009). Some highlights include:

1. FY 2009 (July 1, 2008 – June 30, 2009): There was over 20 percent average loss in endowment values during the first 6 months of FY 2009. While suffering significant losses at this point, the 60 or so “well-endowed” schools are faring better on a percentage basis than the thousands of other schools.
2. FY 2008 (July 1, 2007 – June 30, 2008): Suffering was real, but not as bad as in the first six months of FY 2009. Indeed, many of the schools having endowment values among the top 20 experienced gains during FY 2008. Schools with endowment assets of greater than \$1 billion averaged investment returns of 0.6 percent. Those with endowments below \$50 million had the largest losses, -4.3 percent on average.
3. The rich get relatively richer: One long-standing disparity is persisting. On average, the larger the endowment the greater the percentage return – or the smaller the percentage decline.
4. Managing the ups and downs: Many institutions draw annual earnings from their endowments based on a “trailing” average of returns – averaged over some number (four, for example) of immediately preceding years. This practice will help those institutions weather continuing financial storms.
5. Pity the tuition-dependent private nonprofits: The tuition discounting practices of tuition-dependent independent colleges are imperiled. These institutions have meager endowment earnings relative to their annual operating expenses. Their recruiting, by choice or not, is increasingly weighted toward first-generation, underprepared, needy students, and they accordingly rely heavily on tuition discounting. They often have to draw on modest endowment earnings and wealthier students’ tuition payments to discount needier students’ tuition rates, and even discounting tuition for non-needy, academically well-prepared students in the form of “merit scholarships” in order to raise institutional profiles in periodicals such as the U.S. News and World Report and its annual college rankings.

Tuition-dependent independent schools are more at the mercy of the still evolving economic difficulties than many other institutions.

6. It's tough for some publics, as well: Non-flagship public universities and public community colleges are not unlike tuition-dependent independent institutions in that enrollments may be weighted towards first-generation, underprepared, needy students, and endowment earnings are meager. They differ from tuition-dependent independents, however, in that 1) they are less deeply into the “merit-scholarship” business and 2) they are more dependent on state (and local) public subsidies – even in states, such as NC, that subsidize their private, as well public, institutions. Instead, they have increased tuitions to cover more of their expenses – as the next section will reveal.

### C. Revenues, Expenses, and Tuitions

A recent, excellent report from Jane Wellman and her associates at the Delta Project on Postsecondary Education Costs, Productivity and Accountability clarifies the sources of higher education revenues and identifies how revenues are expended in various categories of annual operating expenses (Wellman 2009), (Delta Project). The report deserves careful analysis. It confirms what many already knew – or thought they knew – and offers valuable insights at this moment of extreme financial distress for tertiary education.

The report is based on an analysis of the latest U.S. Integrated Postsecondary Education Data System (IPEDS) – up to FY 2006 with an emphasis on the five-year period 2002 – 2006 and some references back to 1995 data (IPEDS). While the data are slightly dated, the trends generally point to and correlate to today's context. The report uses two familiar annual operating expense categories: **Total Operating Expenses** (including auxiliaries) and **Education and General Expenses (E&G)**, which are total operating expenses less auxiliary expenses. The report focuses heavily, however, on a third category of spending: **Education and Related Expenses (E&R)**, which are pulled from IPEDS to estimate as accurately as possible the full cost of educating students – by subtracting from E&G expenses the portion that can be attributed to sponsored research and public service. Another way to describe E&R is that it includes all direct expenses for instruction and student services, while also including a fairly apportioned share of admin, facilities (including infrastructure), and maintenance support. For-profit institutions are not included in the analysis, even though they are, along with public community colleges, fastest growing in terms of compounded annual enrollment growth rates. The analysis is sliced and diced by six sectors (explained below in item 2 among some other key highlights from the report).

1. Enrollment headcounts: The six sectors in descending order of headcount enrollments are  
public community college sector > public research sector > public master's sector >  
private master's sector > private research sector > private bachelor's sector
2. Spending on instruction: Ordering the sectors in descending order of average per-FTE E&R expenses affects the above order dramatically, which is a public/private difference transparently revealed in the following table:

Descending Numerical Order	
Enrollments Headcounts	Average Per-FTE E&R Expenses
Public community college sector	Private research sector
Public research sector	Private bachelor's sector
Public master's sector	Private master's sector
Private master's sector	Public research sector
Private research sector	Public master's sector
Private bachelor's sector	Public community college sector

3. First highlight: Public community colleges enrolled more students (~ 6 million) in 2006 than any other sector but had the lowest average per-FTE E&R expenses at \$9,184. More generally, the three public-sector groups collectively serve the vast majority of students in the nation but rank below all of the three private-sector groups in average per-FTE E&R expenses.
4. Growth in tuition dependence: In 2006 dollars, the trend in each of the sectors over the period 2002-2006 was increased dependence on net tuition as a source of revenue growth.
5. Expenses and net tuitions rose in tandem in private institutions: E&R expenses rose over the five-year period in all three private sectors, and net tuition rose roughly proportionately to cover a percentage of E&R expenses that varies dramatically across the three private sectors. In the private research sector, that proportion was at 56 percent in 2006. Excluding the well-endowed private research sector schools that enroll about a million students, the bottom-line analysis pointed to degrees of tuition dependence (among the other private nonprofits) that required net tuition to cover 60-85 percent of E&R expenses in 2006.
6. Expense shifting in the public institutions: The proportion of E&R expenses borne by net tuition in the three public sectors increased over the five year period of analysis, while total E&R expenses remained relatively stable. The proportion of E&R expenses going directly to instruction declined a bit in the same period. The sound-bite result has been that students are increasingly “paying more for less” – their net tuition covering an increasing proportion of E&R expenses, while their institutions expend less on instruction. This trend was most exaggerated in the public research sector.
7. Variations by state: E&R expenses and students’ shares (net tuition) of E&R in the three public sectors varied enormously from state to state. For example, average E&R in 2006 in the public research sector ranged from over \$20,000 per FTE in Minnesota, Pennsylvania, and Connecticut to a bit under \$9,000 in Montana. Subsidies supporting these same expenses varied in proportion to the total E&R expense from a low of 17 percent (of approximately \$18,300 E&R) in VT to highs of 89 percent (of approximately \$12,700 E&R) in PR and 76 percent (of approximately \$18,200) in AK. The national averages are about \$14,100 in E&R subsidized at 49 percent. Public research universities are, well, more public in AK than in VT. These variations are part of the reason that the recent reauthorization of

the Higher Education Act includes provisions for holding states' feet to the fire in terms of the consistency of state subsidies to higher education.

8. Tricky questions: Variations in the state-by-state data (sampled above) raise interesting questions and comparisons. For example, should Montana's two research universities be proud of average per-FTE E&R expenses in the \$9,000 range (subsidized at a 26 percent rate). State policy makers likely would be proud, while the two universities might use the two figures to argue both for a higher level of E&R spending and a higher rate of subsidization by the state. How would Pennsylvania be viewed at over \$20,000 in average E&R subsidized at 65 percent, or Minnesota at over \$20,000 in average E&R subsidized at 56 percent?
9. Outcomes (credentials): The report acknowledges that many community college students are more interested in *completing* 60 credits of academic work than in getting a two-year associate's *degree*. (The word "credential" has been used throughout this document to capture the "completion" concept while clearly including "degree" in its meaning.) Completion and credential accordingly use both degrees and completions as key outcomes. This difference that makes a difference in community colleges makes hardly any difference in any of the 4-year sectors and thereby levels the comparison of 2- and 4-year playing fields when using completions. Completions in 2006 as a percentage of FTEs in the three public sectors range from 23-25 percent, with the research sector at the top and the master's sector at the bottom. The private research and private master's sectors were at 32 and 31 percent, respectively, while the private bachelor's sector was at 24 percent.
10. The costs of completions: E&R expenses per completion are also reported, with the private research and private bachelor's sectors logging, respectively, the highest and next highest spending rates. Indeed, the spending rates per completion follow the order of spending rates in item 2 above – as is to be expected.
11. More on the costs of completions: Follow-on reports from the afore-cited Delta Cost Project offer a) five different methodologies for determining the cost of a four-year degree in the U.S., and also b) more detailed possibilities for framing overall learning productivity in the U.S. – respectively, (Johnson 2009) and (Kelly 2009).

## **X. Proposing an Education Assurance Commons**

*Where you enroll and whom you meet in college is more important than what you learn.*

... paraphrased from one of John Ciardi's commentaries on National Public Radio

*Our shared future is about learning and learning to learn, not about the prestige of institutions.*

... offered here as an outside-in principle in contrast to Ciardi's quip

Ciardi's quip still holds water for those who prefer, qualify for, and can afford a "best-in-the-world" education. The adage offered in response to Ciardi's clever quip, however, better frames the brains race and the need to scale the education enterprise to meet modern demands for intellectual capital. The

current educational system of randomly connected investments, organizations, and processes, however, is failing at the macro level, even if humming along in some micro contexts. Worse, in the U.S. and perhaps in other nations, the larger society is partly to blame. For example, enrollment demand has not materialized in some critical sectors of the U.S. education marketplace such as STEM education, where demand for graduates in some fields goes unmet. Education for the growing proportion of needy students in the pipeline must not only be made available as free of fees as is practicable, but also be marketed and delivered around verified socio-economic demands for education. Education needs to be marketed to new parents in order to mitigate class and cultural barriers that significantly inhibit educational success within large demographic groupings. (See Cal State's profile in productivity in Section III.)

#### **A. Education Assurance**

Access to educational opportunity by those who *a priori* understand its importance and can afford its traditional access models is no longer enough. Educational opportunity is no longer an *end* goal. It is necessary, but not sufficient for meeting modern educational needs. Learning has become a common-good necessity – a keystone in the sustainability of civilization.

Educational opportunity accordingly needs to be subsumed by what Roberts T. Jones calls “**educational assurance**” (R. T. Jones 2009). Micro and macro scalability and sustainability goals for education combine with socio-economic demographic trends to argue not only for *assuring* stable (predictable) government funding conditionally granted to individual learners for access, but also for *assuring* 1) independently verifiable longitudinal “readiness to learn at the next stage” from all government-subsidized learners, and 2) accountability for learning productivity from all the institutions that accept learners’ earned government grants. The education enterprise and its external “investors” – learners, parents, employers, education philanthropies, education NGOs, and governments – would benefit by creating an independent commons that works to *assure not only affordable access to education, but also the quality and scale of its measurable institutional outcomes and learner profiles*.

For now, call this commons the **Education Assurance Commons** (EAC). Think of it as one day operating at the global level, while today forming by piloting micro commons where scale is less foreboding. The instantiation of any such commons should be governed by neither governments, private interests, nor the education enterprise. As with the Internet and the Web, the commons should operate as a compact that is operationally enabled by a loosely coupled governance structure representing the common interests all involved parties.

In awarding the 2009 Nobel Prize in Economics to Elinor Ostrom of Indiana University, the Royal Swedish Academy of Sciences applauded “her analysis of economic governance, especially the commons,” and also announced that:

*Elinor Ostrom has challenged the conventional wisdom that common property is poorly managed and should be either regulated by central authorities or privatized. ... She observes that resource users frequently develop sophisticated mechanisms for decision-making and rule*

*enforcement to handle conflicts of interest, and she characterizes the rules that promote successful outcomes.*

Though education is not “common property” in the form of the sundry natural resources studied by Ostrom, her analysis and award give credence to the arguments herein for improving collaboration between education and its diverse external stakeholder “investors.” Indeed, the overall argument has been that education is but one among several other globally interlocking keystones in the foundation of the greatest commons of all: a sustainable civilization.

Any EAC initiative should balance rights and responsibilities between the education enterprise and education investors – including learners and governments. Government funding would be the main EAC leverage point, perhaps supplemented by philanthropy, for starting an EAC initiative. Governments, after all, are currently subsidizing education. Some are doing so more predictably or generously than others, but all are increasingly demanding more accountability for educational outcomes. The leverage of government funding would be used in any EAC construct to:

- Improve readiness for and commitment to education (through predictable, government grants made directly to learners who earn them over time – earned entitlements via summative longitudinal assessments of readiness to learn at the next stage).
- Require those education providers that accept learners’ government grants to:
  - Administer enrolled learners’ participation in periodic “readiness-to-learn-at-the-next-stage” independent summative assessments from a pool of such assessments.
  - Account institutionally in a peer context for the learning productivity goals described in II.D.

Perhaps the graphic below will capture the spirit of the EAC idea of holding governments accountable for predictable funding for education via grants to learners who longitudinally earn them, while improving accountability from both those learners and their education providers – yet only minimally affecting the governance and educational practices of education providers.

### Born to Learn

- Created “equal and free to pursue happiness”
- Without an education, “freedom’s just another word for nothin’ left to lose.” ... Kris Kristofferson



- Leverage from government grants to *prepared* learners
  - ✓ Improve longitudinal readiness for education (via predictable government grants made directly to learners who earn them).
  - ✓ Require those education providers that accept learners’ government grants to:
    - Administer enrolled learners’ participation in periodic “readiness-to-learn-at-the-next-stage” independent assessments.
    - Account institutionally among peers for learning productivity goals.

## **B. Framework Assumptions for Developing an Education Assurance Commons**

An EAC would promote and govern participation among multiple education stakeholders – learners, governments, education credential providers, learning assessment providers, employers, education support organizations (charitable and for-profit) – in a voluntary compact designed to identify their mutual interests in expanding the capacity for, and access to, learning opportunities that are accountable to and affordable to all the participating parties. The following assumptions are at the heart of the EAC concept:

1. Tertiary-level education and the learning it fosters are critical to the sustainability of civilization.
2. Most modern governments have an interest in investing in education for reasons of competitive advancement and civic and economic security.
3. Socio-economic demographics dictate that learning opportunities be marketed and provided as free as is practicable to expand the percentage of needy individuals in the education pipeline.
4. The utility and affordability of education to governments and individuals depends in part on repairing the leaks in the education pipeline to improve student success rates and to reduce the per-credential-granted expense of providing educational opportunities.
5. ICT must be used strategically by the education enterprise to improve learning productivity at the scale required for civic and economic security.
6. ICT can also be used by education providers and governments to track and report on a small set of learning productivity metrics and student learning outcome profiles responsive to governments' informational needs and providers' accountability obligations within peer mission groupings.
7. Learning productivity metrics cannot be absolute, one-size-fits-all, but can be selected from a limited list of comparative groupings reflecting different missions and governmental contexts.
8. Future and extant suites of independent summative student learning assessments can be selected by peer groups of education providers around the world to be administered to reflect longitudinal educational attainment levels reflecting a learner's basic communication fluencies and critical thinking skills in terms of readiness to pursue further education. A similar process for independently assessing core knowledge in the sciences, social sciences, and humanities might follow.

## **C. Possible Core Objectives for an EAC Compact**

Education cannot be free, but, in return for commitments to quality assurance from participating educational institutions and learners, each group could be affordably supported by governments around the world in the interest of resolving the deeply interconnected ecological and socio-economic sustainability issues described in Section IV. Some countries long have centrally funded tertiary education for qualified students, but can no longer afford “free” education at the scale implied by the brains race and the demographics of the education pipeline. They are changing their

funding models. In the U.S., where education is partially subsidized by states and communities, directly funding the learner (from federal and/or state sources) to acquire educational services is a familiar, if incomplete story. Georgia's tertiary HOPE Scholarship program is but one of several variations on the theme and, like several others, is based on merit that has not been independently assessed. Tertiary-level federal Pell grants, on the other hand, are based on need and may soon become a predictable source of permanent funding. Meanwhile, all states continue to subsidize public tertiary education providers directly, even the states that also directly subsidize students. There have been proposals in the U.S. in the past to replace government subsidies directed to education organizations by government subsidies directed to students. As unimaginable as this might appear in practical political terms, it is nevertheless instructive to speculate about some of the scaffolding from which the concept could be further developed in the context of increasing learning productivity throughout the education pipeline. Although the EAC is an international, politically borderless concept, focusing its core intent within the U.S. will permit the description of one possible configuration of core-like features.

Imagine a tri-partite EAC compact between the public (represented by governments), the individual (represented by the individual's legal guardian prior to "legal" age), and education providers willing or obliged to participate. Further imagine a "to-be-earned-entitlement" for the nascent learner structured to assure as-free-as-practicable ongoing access to education through at least the tertiary baccalaureate level – perhaps conditioned on need, perhaps not. With the recommendations on assessment in Section VII in mind, imagine that the learner must begin to earn the entitlement by regular, periodic participation in common, independent longitudinal learning assessments that are constructivist and normative in gauging educational progress towards enrolling in and earning a tertiary credential. Imagine also that the learner's tertiary baccalaureate-level entitlement is further conditioned by a no-remediation-required performance on the final secondary-level or tertiary associates-level assessment and by subsequently participating in the tertiary baccalaureate-level common assessment process.

The devil is clearly in the detail, but an EAC compact along the lines re-imagined above could:

1. **Incent parents and their children to embrace effective educational philosophies and practices for life.** The compact would clarify for parents – eventually for their children – the bright socio-economic implications of preparing children from birth for success at the tertiary level and beyond – and the painful financial implications of failing to do so.
2. **Bring more focus to how national government funds are allocated to education.** U.S. Federal funding for tertiary education, for example, might:
  - a. Guarantee Pell Grants as a financial core for the EAC's to-be-earned education assurance entitlement – perhaps based on need, perhaps not.
  - b. Bankroll the EAC's longitudinal assessment process.
  - c. Provide each participating learner (guardian) free access (fully subsidized) to an individually selected and customizable life-long learning environment (in the learning cloud) minimally providing software-as-a-service access to:

- i. information about the advantages of education and the EAC compact that is “assuring” education in return for the commitment of the learner (or guardian) to the terms of the compact;
  - ii. placeholders for activating the free (subsidized) privacy-secured participation of the learner in the longitudinal series of learning assessments required to earn the compact’s entitlement;
  - iii. free learning resources appropriate to the learner’s level of learning achievements and objectives;
  - iv. privacy-secured life-long access to an individually customizable learning portfolio function ***under the control of the learner*** (or the learner’s guardian), making it possible for learners, at their discretion, to share securely encrypted access to selective EAC common assessment results and other learning results that have been ***authenticated*** by an EAC education or assessment provider; and
  - v. access to other learning and assessment resources as part of an enrolled-student experience – resources such as the SAS Curriculum Pathways curriculum that is free to education providers and their instructors and students (SAS).
3. **Bring more focus to how regional funds are allocated to education.** States and communities in the U.S. could participate in the EAC and allocate predictable per-learner entitlements to their population based on combinations of factors important in specific regional contexts – need-versus-merit entitlements, economic development, professional and workforce needs, demographic diversity profiles, and so on.
  4. **Require participating education providers to select a subset of provider outcome metrics (within EAC options) to establish their EAC learning productivity profiles.** These metrics would be selected from core EAC grouped options for a) provider metrics, such as credentialing rates and per-credential production expenses, and b) for student-body common learning assessment profiles, such as percentile profiles of aggregated student-body performance on EAC longitudinal learner assessments. They could be supplemented by additional metrics and information under the complete control of the provider.
  5. **Encourage participating education providers to compete in terms that are learner- and learning-centric.** The EAC compact would incent learners to take more responsibility for their own success and, through the EAC process for provider outcome reporting, learn more about their options for choosing a provider.
  6. **Permit access by participating governments and education providers to the privacy-secured longitudinal results of the EAC student learning assessment process and the provider credentialing results for every participating learner.** Educational data would persist with the student, and students would control access to their individual data. They would grant the right to their participating education providers and to their participating governments to identify, for statistical cross tabulation purposes only, their individual

achievements – not their individual identities – from their multiple education providers/credentialers and from all EAC assessment results.

A learning portfolio function is among the functions in the learner’s life-long learning environment envisioned immediately above in 2.c. Most of today’s “e-portfolio applications,” however, are licensed by education providers in a premise-based model for the use of their students, instructors, administrators, and other stakeholders. Such use of “e-portfolio” software tends to be, *a priori*, provider-centric. In contrast, new cloud-based environments can permit portfolio functions that are controlled separately but simultaneously by students, instructors, and institutions – integrated but distinct and distinctly controlled “containers” for data elements that should “belong” to the student as evidence of learning achievements but, when claimed by the student to be externally validated evidence of learning, should require authentication from an education or assessment provider. Such a model can support the mobility of learners and their learning credentials and also the reasonable requests by governments for longitudinal data that tracks learners’ progress in the aggregate through a lifetime of learning. Epsilon, for example, is educational “cloudware” that includes a learning portfolio function potentially as learner centric, instructor centric, and government-research centric, as it is education-provider centric.

#### **D. Implementing an EAC in the Learning Cloud – Two Critical “Interoperability” Functions**

The EAC concept will strike most as “blue-sky” and unrealistic. Fair enough! Twenty years ago, however, who would have predicted the existence and success of today’s growing global consumer market in the cloud powered by Amazon, eBay, and others – and enabled by instantaneous access to buyer-seller information, transactional capacities, and new transparent trust mechanisms that work at least as well as traditional ones? Who would not have scoffed during the dawn of the Internet at a claim that in approximately twenty years a U.S. presidential campaign would virally achieve the reach of presidential candidate Barack Obama’s “cloud campaign” in 2007-2008? The cloud and its influence on how we know what we know and how we communicate with whom we communicate are factors that make the EAC concept less naïve than it may appear. The time is right to consider how the cloud and its evolutionary ICT-enable successors should be tapped to help the world meet the learning productivity challenge.

The EAC is about drawing expertise from and building trust among the various constituencies that would benefit from a more open, effective, and efficient worldwide marketplace for education-based learning focused on, well, learners and their learning outcomes in the context of the civic and socio-economic common good. The EAC is about “interoperability” among the educational opportunities and processes that should work in unison to the shared benefit of individual learners, their families, their governments, their employers, their education providers, and all of the commercial and non-commercial organizations that are vested in supporting the education enterprise. Without such interoperability, the education marketplace will continue to be characterized almost solely by inside-out educational opportunity and will lack an open-market foundation based on a quality-assurance trust equation between education providers and non-provider investors in learning. Extant examples of EAC-like organizations provide food for thought.

The abiding principle of acting locally while collaborating globally implies that most of the learning productivity agenda will be advanced locally. Learning productivity, however, is so dependent on scale and common, assessable, practical standards that a top-down framework is needed to guide local activities. The problem with a top-down approach is that it appears to be under the total control of a top organization. To think beyond that narrow interpretation and move away from the “blue-sky” nature of the EAC, consider the nature and role of the Internet Engineering Task Force and World Wide Web Consortium (IETF), (W3C). Both of these top-level organizations are global in nature and work to establish consensus standards and to ensure interoperability – IETF for the network-of-networks transport medium known as the Internet and W3C for the Web’s presentation/content/application/data exchange/transaction medium. Both are “charitable” governance-oriented organizations focused on navigating the various proprietary interests (nonprofit and for-profit) required to advance different aspects of the common ICT good. They are controlled neither by government nor by business. They rely on informed, volunteer expertise for their “engineering,” demonstrations of interoperability and their interoperability conformance work. They depend on verifiable successes and earned trust to sustain interoperability “standards,” along with their own operations and effectiveness – a model that could ultimately enable the success of a benevolent EAC.

Two additional organizations having many of the characteristics of the IETF and the W3C are needed to move the EAC concept from blue-sky brainstorming to the level of governance and educational interoperability required to advance learning productivity at scale. Because increases in productivity are so dependent on ICT, one organization is about ICT interoperability in the interest of scalability, education-provider productivity, and the mobility of learners, learning records, and the evidence of what learners have learned. The other organization is about the aforementioned common education-provider metrics and student learning outcome assessments that, though not one-size-fits-all, can serve as practical proxies in many mission and geopolitical contexts for the returns on investments in learning to students, governments, employers, and education providers. The two organizations might be labeled for the moment and described as follows:

1. Education Technology Assurance Consortium: The ETAC would be responsible for ICT interoperability standards and standards compliance testing among the myriad of digital applications, processes, resources, records, and artifacts associated with education and learning. Interoperability standards for the technologies used in education and learning help to a) increase participation and competition in the educational ICT marketplace, b) improve the sharing of resources and records among all participants in any education assurance process and, thus, improve the mobility of learners’ longitudinal path through the education market, c) decrease the ICT investments required of education providers, and d) improve any education provider’s learning productivity – and, ultimately, the productivity of the education enterprise. An existing candidate for this ICT interoperability standards organization is the IMS Global Learning Consortium (IMS). (Disclaimer: the author is on the Board of IMS.) There are other standards organizations that can and should contribute to the role represented here by the placeholder ETAC – see (ADL), (PESC), (SIF). IMS, however, is the largest, most comprehensive standards body for the education enterprise and the

technologies it uses. IMS is also an organization with a clear focus on both creating and conformance-testing ICT interoperability standards for educational applications relevant to the life-long learning experience.

2. Education Accountability Assurance Consortium: The EAAC would be responsible for developing and managing processes for identifying and promoting:
  - a. education-provider enterprise accountability metrics – a collection of practical, summative-level learning productivity metrics that could be grouped by provider mission and geopolitical context for adoption by large enough peer groupings of education providers to enable meaningful, openly reported peer comparisons and longitudinal trend analyses. There may be extant candidates for this function. For example, OECD performs a similar function on an international basis, while a national example is the U.S. Department of Education’s National Center for Education Statistics. What is needed, however, is government participation without the political entanglements of a governmental organization. Beyond that, a first goal is, not to set absolute metrics and standards, but to foster and manage collaborative efforts to define common definitions – one or more – for metrics such as “tertiary credentialing rate” that should have broad, if not universal, usage in comparative statistical contexts. The Data Quality Campaign in the U.S. is establishing criteria for data.
  - b. independent learning outcomes accountability options – information about assessment organizations offering student learning outcome assessments at progressive levels of learning maturity in broadly applicable “learning-to-learn” domains such as basic communication fluencies, critical thinking skills, core introductory content in the arts, humanities, and the biological, physical, and social sciences, and high-demand workforce skills. These are organizations such as ACE, ACT, CAE, ETS, and a host of others, some specific to a nation and others more international in their reach (ACE), (ACT), (CAE), (ETS). Critical information about these assessments would include their statistical reach, procedural soundness, and normative practices, along with concordance tables, where available, among competing assessments purporting similar goals. (The purpose of this item is not to imply that there are or should be standards of learning that are commonly shared around the world, only that there are high-enrollment common domains of learning in which students can be reasonably assessed with extant and future summative learning instruments in order to develop aggregate student learning profiles – as per the discussion in Section VII and immediately above in X.C.2.b-c.) There may already be candidates for providing information about the reach and methodologies of the summative learning assessments that are currently and broadly applicable.

The EAAC intent is to give education providers and the public (governments) a means to trust, inform, and support each other – a goal that the Council for Higher Education Accreditation has tried to accomplish for tertiary education in the U.S. and beyond, but may not be able to achieve as long as it is governed by education providers as a “national advocate and institutional voice for *self-regulation* of academic quality through accreditation” (CHEA). By adopting the minimally invasive

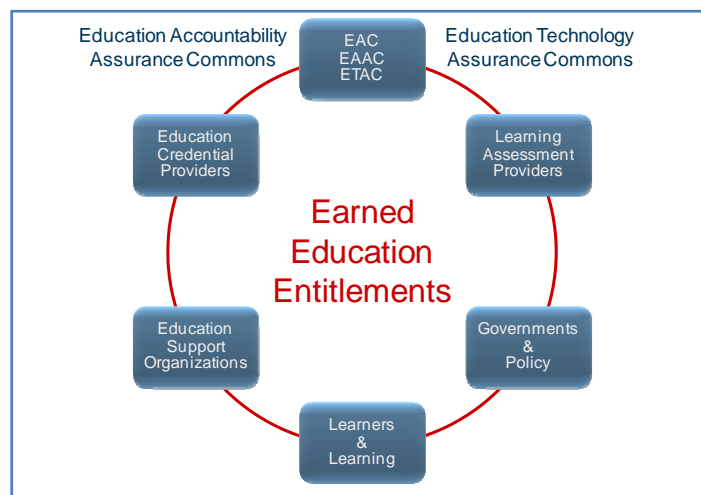
EAC-participation requirements to administer periodic independent assessments of learner readiness for further learning and to account for a few peer-comparative learning productivity metrics, CHEA might persuade the federal government that all other aspects of the accreditation process should remain independent of government influence.

A remarkably prescient 2007 report from the New Commission on the Skills of the American Workforce called for a technology-enabled restructuring of the “business model” for the public-school system in the U.S. (Knapp 2007). There has been some progress towards the goals of that report, which are closely aligned with the learning productivity agenda promoted here. An EAC could speed that good work, and the report’s call for “Board Examinations” is consistent with the EAAC envisioned here and could play a major role in the EAC’s work – and *vice versa*.

**E. Seeding an EAC-Like Effort**

EAC, EAAC, and ETAC could be inter-connected in a variety of models, including one in which EAC serves as a “parent” organization. More important than pursuing the EAC conceptual definition further, however, is to recognize that seed funding is often required to refine the formulation of and pilot seemingly blue-sky efforts to change entrenched “systems.” The education enterprise is nothing, if not an entrenched system, one described earlier through the flippancy thought that policy makers find education too important today to leave entirely in the hands of educators. In the U.S., after all, the heated debate about pressing health care issues owes in no small part to policy makers who for too long left health care dominantly in the hands of the health-care enterprise – private insurers, pharmaceutical companies, hospitals, physicians, on so on. The EAC may be blue-sky, but only if there is no need for education leaders to work as equals with, not against, government leaders and other education-invested stakeholders in order to improve learning productivity.

The Bill and Melinda Gates Foundation and the Lumina Foundation for Education, along with a few others, might judge the learning productivity crisis important enough to provide multi-year start-up support for engaging education providers, governments, employers, and interested education-support companies and charitable organizations in a common-good EAC-like effort to move beyond the current impasses that block large-scale learning productivity movements and improvements.



## XI. Conclusion

The “new economy” appears to be driving a degree of willingness within the education enterprise to consider changes that have been heretofore promoted externally but broadly resisted internally. Such “willingness” may be only a strategy for staying a step ahead of the public-policy posse that controls so many of education’s critical revenue flows. Indeed, a colleague commented that the bail-out of U.S. automobile companies – the “big three” in Detroit – came to mind when she first learned of requests from U.S. tertiary education to participate in the federal “stimulus package.” Are recent pleas in the U.S. to participate in the “stimulus package” evidence of inside-out tone deafness in the education enterprise, which for some time has been facing external pressures to restructure fundamental academic practices to serve more students at more affordable tuition rates and improved credentialing rates? Probably not, for there have been recent restructuring calls from within, perhaps signaling the beginning of a retreat from “doing more only for more” to an embrace, even if of necessity, of learning how to “do more for less” in order to earn broader and deeper policy and public support.

Such restructuring from within an inside-out culture that is not shy about challenging, even censuring, change-management leadership will require the support of governing boards. A member of the Nevada System of Higher Education Board of Regents accordingly suggested in the *Chronicle of Higher Education* that “Colleges Must Face Reality and Recognize Opportunity in the Economic Downturn” (Knecht 2009). In the same *Chronicle* issue, another opinion leader argued that “It’s Time to Improve Academic, Not Just Administrative, Productivity” (Massy 2009). The profiles in productivity described herein and the eleven “Making Opportunity Available” states previously referenced provide concrete evidence of change from within (Lumina-MOA).

Boards and education executives are accustomed to examining financial data, and they should examine the summary data from the Delta Cost Project in the U.S., which for all three of the project’s public sectors are available on a state-by-state basis in some detail (Delta by States). Indeed, expenditures and the sources of revenue to cover them vary widely from state to state. Engaged in a trend to cover an expanding proportion of E&R expenses from net-tuition revenues, public-sector institutions are threatening the affordability of access for students and families on the lower rungs of the U.S. economic ladder. That affordability squeeze, in turn, is increasing public-policy pressure on institutions to reduce average per-credential E&R expenses – even as they simultaneously address workforce and credential attainment-rate issues. Public-sector education leaders in each state therefore should compare their states’ data to data from other states to help determine where not to probe and where to probe – and with what attitude and mindset in terms of the learning productivity crisis and their states’ revenues and revenue allocations to education.

Unlike public institutions, independent (private) institutions in the U.S. have no *a priori* obligation to improve the competitiveness of the workforce. Most, however, are committed to this and other common-good goals. Indeed, they already boast credential attainment rates higher on the average than those of public institutions. Improving the proportion of the adult population holding a credential is, moreover, an opportunity for revenue growth in independent institutions. That opportunity is to meet market demands in the workforce and professions while enrolling students in convenient, flex-

redesigned programs to increase profit margins through capital-expense avoidance and new, frugal but effective pedagogies, thereby reducing per-credential expenses to tame spiraling net-tuition increases.

The education enterprise may find a traditional inside-out “*best-in-the-world*” vision of quality ironically debilitating if, along the way, the educated public abandons its faith that tertiary education is the major component of a solution to civilization’s sustainability crises of ecosystem, economy, and equity. The time is right for the education enterprise to pursue “*best-for-the-world*” strategies enabled by the strategic use of ICT to improve learning productivity by serving more students more effectively, while simultaneously creating a privately and publicly affordable, stable financial model for learning – and securing education’s future as an affordable first-priority imperative for students, families, donors, employers, and governments.

The emerging learning cloud is making unprecedented learning productivity tools available to individual option, while paradoxically requiring top-down coordinated ICT-enabled academic restructuring strategies and performance reporting standards to improve learning productivity at enterprise scale. The cloud nevertheless promises the greatest leverage from ICT for the foreseeable technical future. All around the modern world, a learning crowd is gathering in the learning cloud with dreams of collaboratively winning “victories for humanity.” Success will require that voters, policy makers, governing boards, and education leaders purposefully collaborate to avoid both unnecessarily paternal policy regulation and the chaos of random acts of productivity. An Education Assurance Commons, as outlined in the preceding section, could help all education providers (within their mission constraints, opportunities, and geopolitical contexts) to contribute to global learning imperatives through integrative technical and educational interoperability standards that enable a more open, global learning commons while also increasing outside-in trust in the education enterprise.

Oh! In conclusion, there are two more observations to wrap around the concept of the Education Assurance Commons as it might be practiced in the U.S. First, the difference between public and independent (private) education providers would largely disappear in states that adopted the EAC model by directly funding in-state students (to supplement federal EAC funding), rather than the “public” education providers in the state. Second, the federal tax code could be used to fund learners’ EAC-like earned entitlements. Eliminate the federal tax deduction for bearing and/or raising children, and use the resulting increase in tax revenues to fund the earned entitlements. Both the nation and the families who commit to helping their children start early to prepare for a life of learning would benefit.

## XII. Citations

"satisfice". *Herbert Simon: Contributions to economics - Wikipedia*.

[[http://en.wikipedia.org/wiki/Herbert\\_Simon#Contributions\\_to\\_economics](http://en.wikipedia.org/wiki/Herbert_Simon#Contributions_to_economics)].

AAC&U/CHEA. "New Leadership for Student Learning and Accountability." 2008,

[[http://www.aacu.org/resources/assessment/documents/New\\_Leadership\\_Statement.pdf](http://www.aacu.org/resources/assessment/documents/New_Leadership_Statement.pdf)].

ACE. *American Council on Education GED program*.

[[http://www.acenet.edu/AM/Template.cfm?Section=GED\\_TS](http://www.acenet.edu/AM/Template.cfm?Section=GED_TS)].

Achieve. *Achieve and The American Diploma Project*. [<http://www.achieve.org/>].

ACT. *ACT: Fifty Years 1959 | 2009*. [<http://www.act.org>].

ADL. *Advanced Distributed Learning*. [<http://www.adlnet.org>].

Aldeman, Chad, and Kevin Cary. *Ready to Assemble: A Model State Higher Education Accountability System*. EducationSector Reports, Washington, DC: Education Sector, 2008, [[http://www.educationsector.org/research/research\\_show.htm?doc\\_id=751639](http://www.educationsector.org/research/research_show.htm?doc_id=751639)].

AP. *College Board AE*. [<http://www.collegeboard.com/student/testing/ap/about.html>].

BHEF. *Business Higher Education Forum*. [<http://www.bhef.com>].

*Big Goal*. [<http://www.luminafoundation.org/#bhag>].

Brooks, David. "A sliding set of skills." *New York Times*, 2008: [<http://www.nytimes.com/2008/07/29/opinion/29iht-edbrooks.1.14860590.html>].

CAE. *Council for Aid to Education*. [<http://www.cae.org>].

CCSSE. *Community College Survey of Student Engagement*. [<http://www.ccsse.org>].

CHEA. *Council for Higher Education Accreditation*. [<http://www.chea.org>].

Coase, Ronald H. "The Nature of the Firm." *Economica*, November 1937: 386-405.

College-Board. *2008 Trends in Student Aid*. [<http://www.collegeboard.com/html/costs/aid/>].

Commonfund. *Educational Endowment Report 2009 (FY2008)*. Commonfund Benchmark Studies, Commfund, 2009, [[http://www.commonfund.org/Commonfund/CF+Institute/CI\\_About\\_CBS\\_studies.htm](http://www.commonfund.org/Commonfund/CF+Institute/CI_About_CBS_studies.htm)].

Concordance. *Concordance study by ACT and the College Board*. [<http://professionals.collegeboard.com/data-reports-research/sat/sat-act>].

*Delta by States*. [<http://www.deltacostproject.org/data/state/index.asp>].

*Delta Project*. [<http://www.deltacostproject.org/>].

DQC. *Data Quality Campaign*. [<http://www.dataqualitycampaign.org/>].

Ekman, Richard. *Evidence of Learning: Applying the Collegiate Learning Assessment to Improve Teaching and Learning in the Liberal Arts College Experience*. [[http://www.cic.org/publications/books\\_reports/CLAreport.pdf](http://www.cic.org/publications/books_reports/CLAreport.pdf)], Washington, DC: The Council of Independent Colleges, 2008.

ETS. *Educational Testing Service*. [<http://www.ets.org>].

Ewell, Peter. "No Correlation: Musings on Some Myths About Quality." *Change*, November - December 2008: [<http://www.changemag.org/Archives/Back%20Issues/November-December%202008/full-no-correlation.html>].

Friedman, Thomas L. *The World Is Flat: A Brief History of the Twenty-First Century [Further Updated and Expanded; Release 3.0]*. [<http://www.thomasfriedman.com/bookshelf/the-world-is-flat>]: Farrar, Straus & Giroux, 2007.

Goldin, Claudia and Katz, Lawrence. *The Race Between Education and Technology*. Harvard University Press, 2008.

Graves, William H. "Voluntary Counter-Reformation: Stepping Up to the Challenge." *EDUCAUSE Review*, July-August 2007: 26-38.

—. *The Learning Cloud*. [<http://institutionalperformance.typepad.com/>].

Heckman, James. *Schools, Skills, and Synapses*. [<http://www.hup.harvard.edu/catalog/golrac.html>], Social Science Research Network, 2008.

IETF. *Internet Engineering Task Force*. [<http://www.ietf.org/>].

IMS. *IMS Global Learning Consortium*. [<http://imsglobal.org/>].

*Information Technology in the Service Society: A Twenty-First Century Lever*. Committee to Study the Impact of Information Technology on the Performance of Service Activities, Computer Science and Telecommunications Board, National Research Council, Washington, DC: National Academy Press, 1994, [[http://www.nap.edu/catalog.php?record\\_id=2237](http://www.nap.edu/catalog.php?record_id=2237)].

IPEDS. *NCES*. 2009. [<http://nces.ed.gov/IPEDS/>].

Johnson, Nate. *What does a college degree cost?* Delta Cost Project, 2009, [[http://www.deltacostproject.org/resources/pdf/johnson3-09\\_WP.pdf](http://www.deltacostproject.org/resources/pdf/johnson3-09_WP.pdf)].

Johnstone, Bruce D. *Learning Productivity: A New Imperative for American Higher Education*. Studies in Higher Education # 3, Albany, NY: State University of New York, 1993.

Jones, Dennis S. *State Shortfalls Projected to Continue Despite Economic Gains: Long Term Prospects for Higher Education No Brighter*. 2006. [[http://www.highereducation.org/reports/pa\\_shortfalls/index.shtml](http://www.highereducation.org/reports/pa_shortfalls/index.shtml)].

Jones, Roberts T. *The New American Workforce: Challenges and Opportunities for Higher Education*. Draft preprint, Springboard Project, 2009.

Kelly, Patrick J. *The dreaded "P" word*. Delta Cost Project, 2009, [[http://www.deltacostproject.org/resources/pdf/Kelly07-09\\_WP.pdf](http://www.deltacostproject.org/resources/pdf/Kelly07-09_WP.pdf)].

Kirwan, William "Brit". *Coming to Our Senses: Education and the American Future*. Commission on Access, Admissions, and Success in Higher Education, College Board, 2008, [<http://74.125.95.132/search?q=cache:xxzqXXzFKq0J:professionals.collegeboard.com/profdownload/coming-to-our-senses-college-board-2008.pdf+Coming+to+our+senses&cd=6&hl=en&ct=clnk&gl=us>].

Knapp, Charles B. *Tough Choices or Tough Times: Executive Summary*. [<http://skillscommission.org/>], New Commission on the Skills of the American Workforce, National Center on Education and the Economy, 2007.

Knecht, Ron. "Colleges Must Face Reality and Recognize Opportunity in the Economic Downturn." *Chronicle of Higher Education*, January 9, 2009.

Lingenfelter, Paul E. *State Higher Education Finance FY 2005 Executive Overview*. annual, SHEEO, 2006, [[http://www.sheeo.org/finance/exov\\_fy05\\_v2.pdf](http://www.sheeo.org/finance/exov_fy05_v2.pdf)].

Lumina-MOA. *Learning Year*. [<http://www.makingopportunityaffordable.org/page/opportunity-grant-program/learning-year>].

Massy, William F. "It's Time to Improve Academic, Not Just Administrative, Productivity." *Chronicle of Higher Education*, January 2, 2009.

McPherson, Peter, and David Shulenburger. *Expanding Undergraduate Education to Meet National Goals: The Role of Research Universities*. [<http://www.aplu.org/NetCommunity/Page.aspx?pid=1301>], Washington: Association of Public and Land-grant Universities, 2009.

NACUBO. *2008 NACUBO Endowment Study*. Washington, DC: NACUBO, 2009, [[http://www.nacubo.org/Products/Online\\_Research/2008\\_NACUBO\\_Endowment\\_Study.html](http://www.nacubo.org/Products/Online_Research/2008_NACUBO_Endowment_Study.html)].

NAICU. *UCAN*. [<http://www.ucan-network.org/>].

NCES. *Fast Facts*. [<http://nces.ed.gov/fastfacts/display.asp?id=98>].

NILOA. [<http://www.learningoutcomeassessment.org/index.html>].

Norris, Donald, Joan Leonard, Louis Pugliese, Linda Baer, and Paul Le. "Framing Action Analytics and Putting Them to Work." *EDUCAUSE Review*, Vol.43, No.1, Jan.-Feb. 2008: [<http://www.educause.edu/EDUCAUSE+Review/EDUCAUSEReviewMagazineVolume43/ActionAnalyticsMeasuringandImp/162422>].

NSSE. *National Survey of Student Engagement*. [<http://nsse.iub.edu>].

OECD. *Organisation for Economic Co-operation and Development*. [[http://www.oecd.org/home/0,2987,en\\_2649\\_201185\\_1\\_1\\_1\\_1\\_1,00.html](http://www.oecd.org/home/0,2987,en_2649_201185_1_1_1_1_1,00.html)] (accessed 2009).

PESC. *Postsecondary Electronic Standards Council*. [<http://www.pesc.org>].

SAS. *SAS Curriculum Pathways*. [<http://www.sascurriculumpathways.com>].

SHEEO. *Accountability for Better Results: A National Imperative*. National Commission on Accountability in Higher Education, [<http://www.sheeo.org/account/accountability.pdf>]: State Higher Education Executive Officers, 2005.

SIF. *The SIF Association*. [<http://www.sifinfo.org>].

Spellings. *A Test of Leadership: Charting the Future of U.S. Higher Education*. Secretary of Education Margaret Spellings Commission on the Future of Higher Education, [<http://www.ed.gov/about/bdscomm/list/hiedfuture/reports/final-report.pdf>]: U.S. Department of Education, 2006.

SRMN. *STEM Research and Modeling Network*. [<http://groups.google.com/groups/SRMN>].

Twigg, Carol. *National Center for Academic Transformation*. [<http://www.theNCAT.org>].

UNESCO. *The New Dynamics of Higher Education and Research for Societal Change and Development*. [<http://unesdoc.unesco.org/images/0018/001832/183277e.pdf>], UNESCO, 2009.

VSA. *Voluntary System of Accountability*. [<http://www.voluntarysystem.org/index.cfm>].

W3C. *World Wide Web Consortium*. [<http://www.w3.org/>].

Wellman, Jane V. *Trends in College Spending*. Washington, DC: Delta Cost Project, 2009, [[http://www.deltacostproject.org/resources/pdf/trends\\_in\\_spending-report.pdf](http://www.deltacostproject.org/resources/pdf/trends_in_spending-report.pdf)].

### **XIII. About the Author**

Dr. William H. Graves earned a mathematics Ph.D. from Indiana University. He then served the University of North Carolina at Chapel Hill (UNC) for over 30 years – as a professor, dean for general education, interim vice chancellor for academic affairs, senior information technology officer, and founder of the Institute for Academic Technology (a UNC/IBM alliance). Today an emeritus professor at UNC, Graves is full-time senior vice president for academic strategy on the executive leadership team at SunGard Higher Education. He is also a member of the board of governors of Antioch University.

While on leave from UNC in 1998-2000, Graves founded the nonprofit Collegis Research Institute. He then retired from UNC in 2000 to found (and chair the board of) Eduprise, an academic technology services firm. After Eduprise merged with Collegis, the resulting privately held company was acquired in 2004 by SunGard Data Systems and later became part of privately held SunGard Higher Education, the world's largest, most comprehensive ICT-related business focused solely on tertiary education.

Graves has helped to pioneer technology-enabled strategies for measurably improving upon and accounting for institutional productivity in tertiary education – learning productivity. Along the way, he has consulted with hundreds of institutions; published 80+ articles and books; delivered hundreds of invited presentations; served on the boards of CAUSE, EDUCAUSE, and the Coalition for Networked Information, served on the Tenth Anniversary Commission of the Council for Higher Education Accreditation, and helped launch both Internet2 and the EDUCAUSE Learning Initiative (chairing the

latter's planning committee from 1994-2004). He also has advised other national organizations, such as the U.S. Department of Education and the Lumina Foundation. Today Graves actively serves as a co-founding board member of both the National Center for Academic Transformation and the IMS Global Learning Consortium.