BACKGROUND PAPERS

Convening on Financial Data in Higher Education

What Do Higher Education Leaders Need to Know About Institutional Finance? And What Can Available Data Tell Them?

Donna M. Desrochers, Matthew Soldner, and Thomas Weko, *Delta Cost Project at American Institutes for Research*

Financial Data at the Crossroads of Cost Containment and Educational Innovation

Dennis P. Jones, *National Center for Higher Education Management Systems*

Key Challenges in Higher Education: An Economic Models Perspective

Jacalyn A. Askin and Bob Shea, *National Association of College and University Business Officers*

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CPRS™ Center for Policy Research and Strategy™
TIAA INSTITUTE
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American Council on Education

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Background Papers
Convening on Financial Data in Higher Education

The background papers for this publication were in preparation for a roundtable jointly convened by ACE and the TIAA Institute in September 2015. They were funded by the TIAA Institute.

Suggested Citation: American Council on Education. 2016. *Background Papers, Convening on Financial Data in Higher Education.* Washington, DC: American Council on Education.

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PREFACE

In September 2015, the American Council on Education (ACE) and the TIAA Institute invited over 40 higher education thought leaders, business model experts, chief financial officers, and chief academic officers from colleges and universities across the nation to participate in a daylong exploration of the financial data challenges faced by postsecondary leaders as they seek to ensure college affordability while at the same time manage shrinking revenue growth and the need for pedagogical and other innovations.

The dynamic conversation focused on three main questions:

- What are the strengths and weaknesses of available data sets for unpacking how resources and processes are used to deliver value in higher education?
- What would be necessary to improve the data to more deeply explore key performance variables at the institution level?
- How can enhanced data sets be used with business model analytical tools to explore key affordability and innovation questions?

Participants were selected and invited by recommendation of ACE, TIAA Institute, and the National Association of College and University Business Officers (NACUBO) leadership, as well as by recommendation of those who were innovators in the arena of budgeting and finance. While the group represented a diverse set of institution sectors and background, the nature of the dialogue was open and generous, with a genuine curiosity about directions for the future.

In conjunction with the convening, ACE's Center for Policy Research and Strategy (CPRS) commissioned three background papers on financial data and change management in higher education. Given the significance of these issue papers in pushing us to seek out fresh insights on how financial transparency and leadership could be aligned to enhance higher education academic and business models, we have bundled them together for easier dissemination in the hope that they will serve as a springboard for similar conversations. Paper descriptions are provided below.

In a paper titled *What Do Higher Education Leaders Need to Know About Institutional Finance? And What Can Available Data Tell Them?*, Donna Desrochers, Matthew Soldner, and Thomas Weko of American Institutes for Research explore availability and limitations of institutional and public financial datasets to inform management and innovation initiatives.

Financial Data at the Crossroads of Cost Containment and Educational Innovation, by Dennis Jones from the National Center for Higher Education Management Systems, unpacks available institutional financial data to suggest key financial measures and conventions for productive educational program delivery and also theorizes about the application of these conventions to innovative models such as

online and competency-based education.

In their paper *Key Challenges in Higher Education: An Economic Models Perspective*, authors Jacalyn Askin and Bob Shea of the National Association of College and University Business Officers build on their work in the New Economic Models project to identify key leadership issues as the financial model of higher education transforms in response to changing economic and policy environments.

The 2015 convening saw a depth of dialogue and debate on challenging cross-sector topics pertinent to the future of higher education. Two central themes emerged from the day's discussion: 1) the need for further pursuit of financial data transparency, and 2) the need for data-driven leadership at all levels of the institution. Leaders expressed a need for more members of the campus community to be able to understand the costs and benefits of educational delivery as a means to better decision making, hence the need for financial data in more accessible forms. With regard to leadership, participants agreed that such data were needed to honor and incentivize the strengths of the shared governance model of higher education.

The convening and emergent themes inspired the CPRS paper ***Evolving Higher Education Business Models: Using Data to Deliver Results***. The paper draws from the business literature, particularly business-model and networked organization theories and analysis. It explores how higher education is moving from a data-poor to a data-rich environment and examines leadership strategies that presidents and their teams can use to couple financial and learning outcomes data with business model analysis to drive performance and enhance the academic enterprise. The networked organization frame posits a way to align incentives in distributed value chains to encourage participants to deliver value that serves consumers and leverages each other's strengths. This seemed well aligned with a need to improve upon shared governance for a time of financial constraints and innovation imperatives.

Louis Soares, Vice President
Center for Policy Research and Strategy
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What Do Higher Education Leaders Need to Know About Institutional Finance? And What Can Available Data Tell Them?

Donna M. Desrochers, Matthew Soldner, and Thomas Weko, Delta Cost Project at American Institutes for Research[1]

INTRODUCTION

Higher education in the United States is facing a challenging financial landscape. It is under pressure to expand opportunities, serve increasingly diverse student populations, limit rising prices, and improve student learning and employability outcomes—all while containing or reducing operating costs. As Daniel Greenstein, director of postsecondary programs at the Bill & Melinda Gates Foundation observes in the March 26, 2015 *Gates Postsecondary Success Notes* newsletter, this "mandates that we rethink how institutions and systems do their business, as well as address the policy environment in which they operate."

Many senior higher education administrators acknowledge that their current business models are ill equipped to meet the challenges ahead. Fewer than one-half of public and private nonprofit college and university presidents are confident their business models are sustainable over the next 10 years. Finance officers are even less optimistic: only 40 percent believe in the long-term sustainability of current models (*Inside Higher Ed* 2014a, 2014b).

The higher education community must do more than rethink the shape of higher education institutions and their business systems. We must also rethink how we measure and analyze the finances of higher education institutions; our inherited ways of doing so fail to provide answers we need for fruitful thinking about "how institutions and systems do their business."

To assist in this rethinking, this issue paper poses three primary questions:

1. What do higher education institutional leaders and stakeholders need to know about institutional spending?
2. What can existing data tell us, and what questions are they unable to answer?
3. What options exist to obtain data on unanswered questions and make them available to analysts inside and outside of higher education institutions?

The paper will begin by identifying the financial and performance questions that concern higher education institutional leaders and stakeholders. Next, it describes existing higher education finance data collections, and the information they can, and cannot, provide. Lastly, the paper examines possible pathways forward.

1 Please direct inquiries to Matthew Soldner, msoldner@air.org.

What Higher Education Leaders Need to Know About Institutional Spending

For simplicity, one may identify two sets of higher education leaders: those who *lead and manage higher education institutions* (presidents, provosts, and chief financial officers), and *external stakeholders* who call upon managers to account for their stewardship of resources, including trustees and policymakers located in system offices, state budget offices, and appropriations committees.

Broadly speaking, external stakeholders' concerns about spending are less granular than those of institutional leaders; their focus is on the allocation of resources among institutions and comparisons of institutional performance. State budget offices do not care, for example, how much money the English Department receives, or whether an institution is spending more on advising per student than its peers. Those who lead and manage institutions are focused on the allocation of resources within the institution, and on the alignment of resources to mission. Institutional comparisons are useful, but more granular information is needed to make strategic decisions about the allocation of resources to programs, activities, and services. For this paper, we concern ourselves primarily with the information needs of those who lead and manage institutions, since granular information about spending that is useful to institutions can be aggregated to provide evidence that supports thoughtful policy choices. Rethinking finance data should proceed "from the bottom up."

How does my institution compare to others like it on financial and outcome metrics?

Institutional leaders and stakeholders often compare colleges and universities to their peers on financial and performance metrics. Comparisons of institution-level financial metrics are useful in pinpointing areas where institutions may be operating in ways that depart from past patterns, or in ways that differ from peer institutions or aggregate benchmarks. Within-institution trend analyses can identify early warning indicators that may signal the need to reallocate financial resources. They can also provide a way to measure the effect of policies and programs designed to change the distribution of revenues and expenditures. Comparisons across institutions can yield different but similarly important findings, including information about relative investments in key activities, student outcomes, and efficient resource use.

However, institution-level trend and benchmarking analyses are less useful when institutions need to determine the underlying cause of these patterns and trends (e.g., rising health-care costs, the changing composition of professional staff, or executive compensation) or develop targeted interventions to contain costs while maintaining quality.

What changes could my institution implement to become more efficient or cost effective?

When institutional leaders need to understand *why* costs are what they are, or how those costs might be expected to shift given a particular intervention, information about institutional costs below the aggregate level are needed. This might include resource data at the academic program, function, or activity level, as well as detailed information on spending and potential cost drivers outside the instructional setting.

An example, familiar to many, is something akin to: "*Would it be more or less expensive to eliminate stand-alone remedial instruction, and incorporate added assessments, differentiated curriculum, and more extensive learning supports within our institution's introductory courses*?" More nuanced questions about institutional performance might also be combined with a need to compare against peer or national benchmarks, such as, "*Are we graduating as many biology or business students per thousand dollars of instructional spending as institutions in our peer aspiration group*?" or, *"What is the source of rising student services costs, and are we spending more or less than other institutions on activities to improve student retention and outcomes?"*

How can we most efficiently allocate our resources to reach our most important goals?

The third type of question that higher education leaders might pose extends beyond an analysis of costs. It links detailed information about costs to evidence on the effect of alternative educational structures and practices, allowing leaders to evaluate the implications of resource reallocation on student outcomes. For example, "*Will the impact of integrated remedial instruction improve retention and completion enough to help us recover the added cost of providing instruction this way*?" Or, "*If we have $20 million to invest with the goal of reducing entering student attrition by 15 percent, would it be more efficient to invest that money in introductory course size reduction, replacing one quarter of adjunct instructors with permanent staff, or a better learning management system (LMS)?*"

Answering questions such as these requires two very different types of information, neither of which is routinely available to many institutional leaders. The first relates to the efficacy of a proposed intervention. If evidence of effect is not based or is not rigorously grounded (that is, if we cannot have confidence the effect being observed is attributable solely to the intervention at hand) even the most careful cost analysis is of little use. If, for example, an institution is offered a "student retention solution" from a proprietary provider that comes with highly detailed cost information, but without strong evidence of the intervention's effect, a leader's capacity to make efficient choices is limited. The second kind of information needed, and often equally as challenging to produce, is an accurate estimate of the resource cost of implementing the treatment. For example, at the outset it may be difficult to determine *"How much will it cost to integrate remedial instruction?"* or *"Is $20 million enough to reduce student attrition by 15 percent?"* As we discuss below, few institutions currently engage in the type of costing activities that would yield credible and actionable results.

What Publicly Available Higher Education Data Can Tell Us

Information on a broad set of higher education spending and outcome measures is publicly available for most colleges and universities. The most comprehensive higher education data comes from the U.S. Department of Education's Integrated Postsecondary Education Data System (IPEDS), administered by the National Center for Education Statistics.

Each year, a series of nine IPEDS survey components are administered to four-year, two-year, and less-than-two-year postsecondary providers to collect information on their enrollments, finance, staffing, completions, graduation rates, financial aid, and institutional characteristics. Participation is required for all public, private not-for-profit, and private for-profit institutions that participate in Title IV federal financial aid programs. Other data on specialized topics, such as endowment values, athletic spending, or information technology spending, is collected by various associations but institution-level information is often not publicly available or requires a data-usage fee.

While IPEDS provides a wealth of information dating back to the 1986–87 academic year,[2] institutional comparisons are hindered by survey reporting requirements that vary among sectors and survey changes over time. Notably, the finance survey has undergone a series of changes related to reporting requirements specified by national accounting standard boards, which differ for public and private institutions.[3] Since

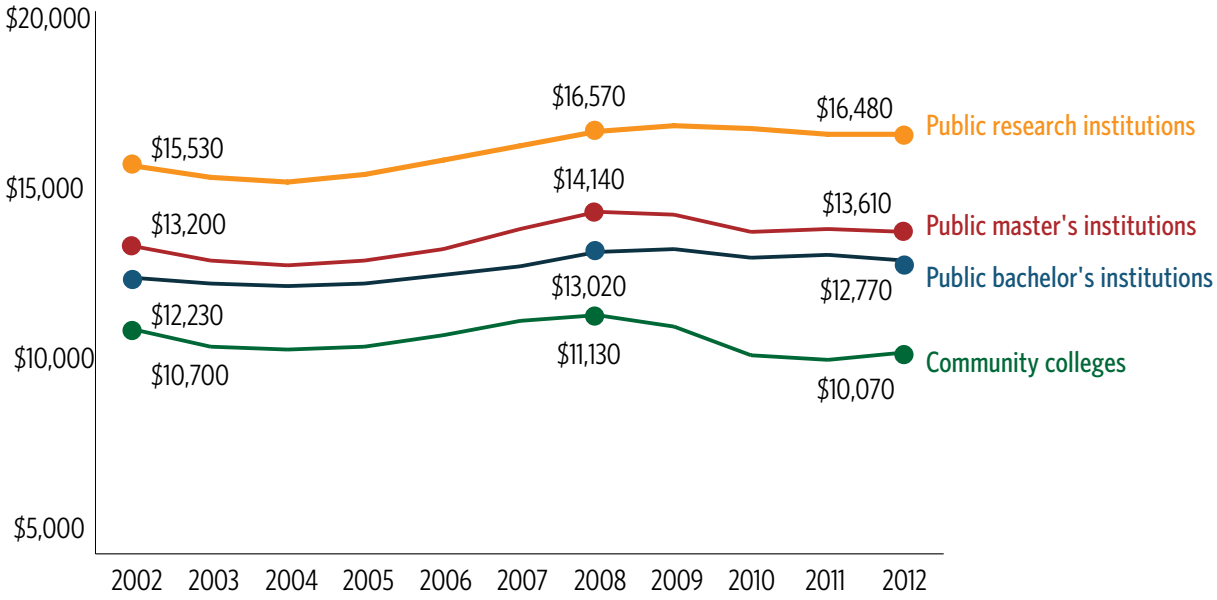
2 Prior to the 1986–87 academic year, higher education data was collected beginning in the 1966–67 academic year, by the Higher Education General Information Survey (HEGIS).

3 Between fiscal 1987 and fiscal 1996, all institutions reported finance information on the same IPEDS survey. Beginning in fiscal 1997, private not-for-profit institutions, which follow the Finance Accounting Standards Board (FASB) guidelines, began reporting on a new finance survey that provided similar information, but in a different reporting format. In fiscal 2002, a separate survey change was phased in for public institutions following Government Accounting Standards Board (GASB) guidelines. A second major change in the GASB finance survey was phased in beginning in fiscal 2008, resulting in a reporting format that was similar to FASB institutions.

fiscal 1997, public and private institutions have reported financial information on different IPEDS surveys, which have continued to evolve.

Fortunately many of the reporting differences and survey changes can be reconciled to generate comparable information among institutions, and over time. The data transformations required to provide comparable analyses among higher education institutions are captured, to the extent possible, in the Delta Cost Project Database, which currently includes data from 1987 to 2012.[4]

Figure 1: Average Education and Related Spending per Full-time Equivalent Student, Fiscal 2002–2012 (in 2012 dollars)



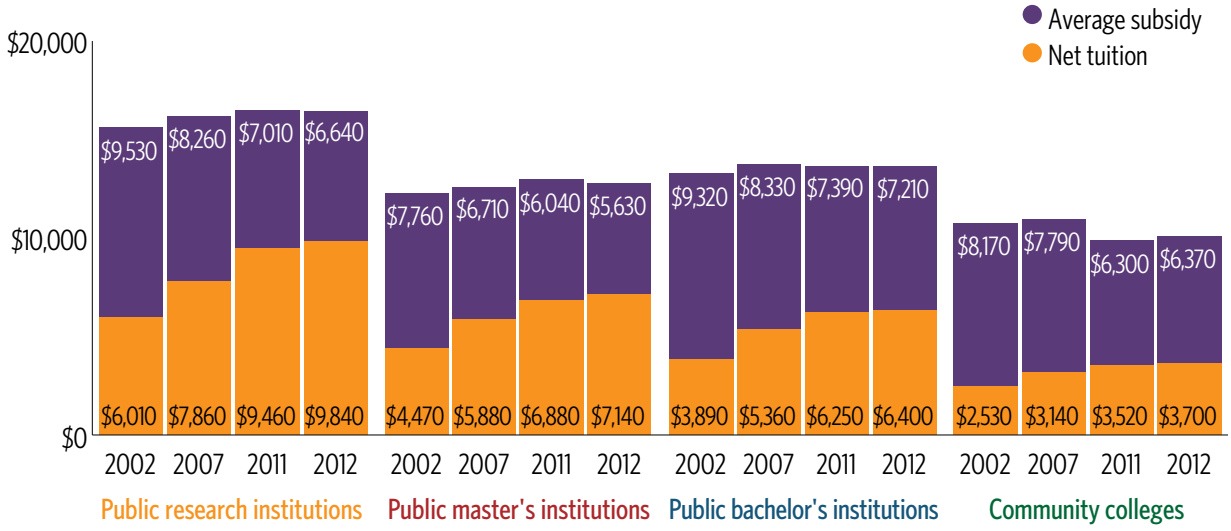
Sources: IPEDS Analytics: Delta Cost Project Database 1987–2012 (11-year matched set).

Delta's improvements to IPEDS permit us to look at high-level patterns and trends in college spending. Delta provides a broad understanding of how much money institutions are spending, what the money is being spent on, and how it has changed over time. For instance, isolating spending related to the academic mission[5] shows average education and related spending per full-time equivalent (FTE) student declined across all types of public institutions since the onset of the 2008 recession (see Figure 1). Community colleges were hit hardest and spent less money per student in 2012 than a decade earlier; however, public research universities sustained smaller cuts and still spent nearly $1,000 more per student in 2012 compared to 2002.

4 In addition to reconciling survey changes over time, the Delta Database also facilitates longitudinal analyses by accounting for parent/child reporting relationships present in IPEDS, creating institutional panels for multi-year analyses, developing consistent variables names and derived variables, and providing financial information standardized by enrollment and inflation adjustments.

5 Excluding spending on sponsored research, public services, and auxiliaries such as student housing and bookstores.

Figure 2: Average Education and Related Spending per Full-time Equivalent Student, by Net Tuition and Subsidies, Fiscal 2002–2012 (in 2012 dollars)



Sources: IPEDS Analytics: Delta Cost Project Database 1987–2012 (11-year matched set).

Metrics derived using extant data showed there is much to be learned from information that is contextualized through comparative and historic analyses. Metrics designed to go beyond measures of total revenues and spending broadly illustrate how well financial and institutional decisions align with institutions' own priorities, and compare with similar institutions.

For external stakeholders, especially those in government, it is important to understand what colleges and universities spend on their academic mission, but also whether spending on administration is rising faster than instruction, how much spending students and institutional subsidies finance, and whether the cost of producing a degree is increasing. For example, rapidly rising tuition prices suggest that college spending is out of control, but this largely reflects massive cost-shifting within higher education. Institutional subsidies[6] at public colleges and universities declined by an average of 22 percent or more between 2002 and 2012 after adjusting for enrollment and inflation (see Figure 2). Student tuition revenue was used to backfill lost revenue, while spending increased modestly. So, while students were paying more, institutions were not necessarily providing them with more educational resources.

Although the Delta Cost Project has greatly improved the usefulness of IPEDS data, there are limitations to IPEDS data that it cannot solve. Because IPEDS is collected at the institutional rather than program or activity level, it is not sufficiently detailed to pinpoint specific cost drivers, nor is it linked to student-level data that would allow spending to be linked to outcomes. To provide an evidence-based response to the cost and productivity challenges facing higher education, new evidence is needed.

Moving Beyond IPEDS

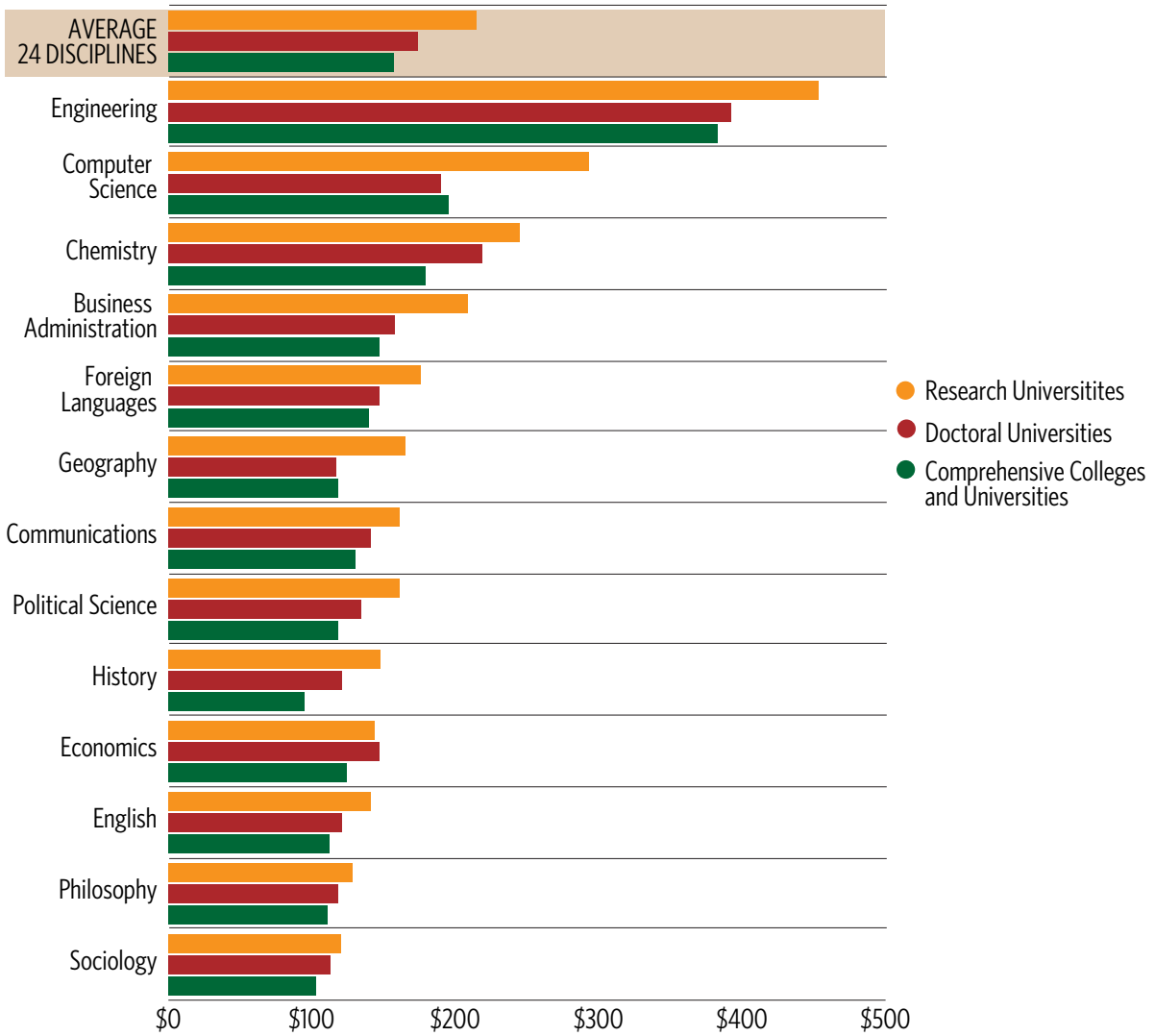
If IPEDS data are insufficient to address the increasingly complex questions facing institutional leaders and education policymakers, where can stakeholders turn for answers? Below, we consider existing methodologies and promising practices that may offer interim solutions and platforms for greater innovation.

6 At public institutions, state and local appropriations are the primary source of institutional subsidies.

Costing instructional programs

The *National Study of Instructional Costs and Productivity*, better known as the Delaware Cost Study, collects direct spending on instruction by program for participating four-year institutions. Participating institutions receive feedback on their own institutions, benchmarked against peers and national estimates. The Delaware Cost Study reports direct instructional costs per student credit hour across 24 disciplines, with Figure 3 showing the most common disciplines. The Delaware study provides useful aggregated spending benchmarks, and also illustrates that program mix is a much larger determinant of overall costs than the type of college or university offering a program.

Figure 3: Direct Instructional Costs per Student Credit Hour Taught: Delaware Cost Study Benchmarks, Fiscal 2003



Source: Middaugh, Michael M. 2005. "Understanding Higher Education Costs." *Planning for Higher Education*. 33(3): 15–18.

At its core, the Delaware Cost Study provides critical insights about the *direct* cost of instruction in a given educational program, including salaries and benefits of faculty and departmental staff, and non-labor costs such

as travel and office or lab supplies. This approach functions well as a rough benchmarking or planning tool for provosts and other institutional leaders who wish to know, for example, "*What would it cost me to build a program in X, which I don't have at present?*" or, "*Is my instruction cost per FTE out of line with peer institutions?*"

What the Delaware Cost Study does not do is provide a deep understanding of the *full* cost of instruction, which encompasses any number of additional human, and non-human, resources that institutions deploy to deliver that education. It does not include the cost of activities that are operated by non-academic units, including costs associated with educational technology, central administrative support, student supports, and operations, maintenance, and depreciation.

Little detail is available on the costs of non-academic activities, apart from the specific information collected by associations whose members have an interest in this information. Many of these activities may not be manifestly instructional, but are nonetheless critical to institutional efforts to achieve their specific missions. Running the gamut from admissions and marketing functions to career and alumni services, these operations can be situated anywhere on the campus organizational chart. Each requires a commitment of institutional resources, each makes more (or less) of a contribution to student success, and each is a component of any "true accounting" of what it costs to educate a given student.

Because the Delaware Cost Study is, foremost, a service to its members, its data are not regularly made available as a public resource. However, in some states information on academic program costs is available for public institutions. This can include detailed information about instructional costs, credit hours, and cost per credit hour across programs and instructional levels. This information allows comparisons of instructional costs and credit hours across programs for lower- and upper-level undergraduate and graduate programs[7] (Johnson 2009; Basu-Conger, Bell, and Stanley 2010).

Methods for collecting this information often differ across states. Some systems include only direct instructional expenses, while others may include all or partial indirect expenses. The allocation of credit hours to instructional level also differs, with some using the course level and others using the student level; however, these differences do not appear to affect relative cost per credit hour in a meaningful way. Because relatively few states implement these costing methodologies, this information cannot easily support interstate peer comparisons, and is principally used for intrastate benchmarking.

Information collected by these state systems (or the Delaware Cost Study) can be used to broadly address limitations in IPEDS. Cost estimates can be *constructed* by level or program mix by applying "weights" or coefficients derived from this data to existing financial totals available in IPEDS. Because this approach is likely to produce substantial errors when estimating costs at a detailed level, it is best adapted to highly aggregated state or system-level information needs.

Activity-based costing

Answering increasingly detailed questions about resource allocation requires data well below the institutional level. However, institutions are typically required to only report costs by broad function, such as instruction, research, and student services, and are rarely asked to assign costs to specific activities that comprise those functions. For example, instructional spending is generally reported in the aggregate, yet instruction encompasses a number of different activities, including course development, individual tutoring, advising and, of course, teaching.

Activity-based costing originated in manufacturing to provide a better way of allocating fixed overhead and administrative costs (e.g., indirect costs) to product lines. For example, information on the cost of operating a customer call center and the number of calls received can be used to determine a per-call cost. When combined

7 Examples include Florida, Illinois, Ohio, New York, Minnesota, and Texas.

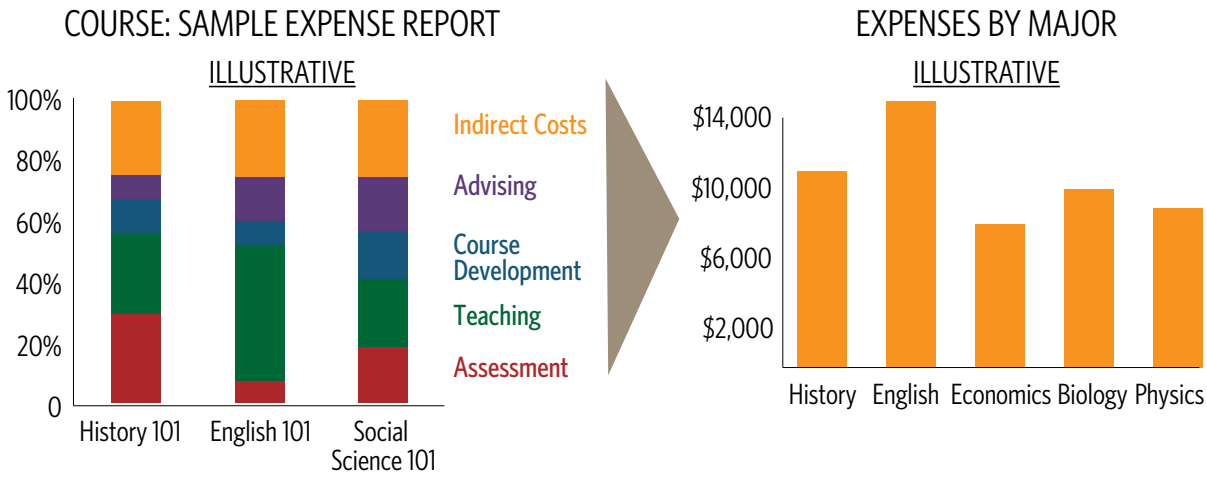
with information on the number of calls for each product, call center costs can be allocated across product lines and included as part of the full cost of production. Other industries with significant overhead and diverse product or services lines, such as construction, healthcare, and banking, also use activity-based costing. [8]

In higher education, there is little information on the underlying costs of the educational "product," whether at the institution level, academic unit level, or course level. So activity-based costing is applied first to understand the instructional cost drivers, and then the associated overhead, or indirect, costs are often added (Hurlburt, Kirshstein, and Rossol-Allison 2014; Anguiano 2013). Activity-based costing looks at how much time is spent on specific predefined activities (e.g., teaching, course development, and student advising) and on the personnel and non-labor costs associated with these activities. This approach focuses primarily on the work that is performed, reflecting on the work process itself, and attempts to encompass the totality of resources is required to execute the process successfully.

The level of rigor with which this resource accounting takes place can vary substantially. In a typical implementation, the focus of the costing exercise is the identification of the underlying cost activities, and the proportions of time staff members devote to each activity so that salary and benefit costs can be allocated accordingly.[9] Salary and benefit expenses are collected by academic unit and are allocated to activities within each academic unit by multiplying these costs by the estimated proportion of time staff spent on each activity. Labor costs are then aggregated to the institution level by summing these costs across academic units.

Non-labor costs, such as supplies, travel, and software, are collected at the institution level and are distributed among the academic units using an appropriate weight, such as the number of FTE students or staff, or student credit hours produced by the academic unit. These costs are then allocated to activities using the staff time estimates and aggregated back to the institution level by summing across academic units.

Figure 4: Sample Activity-Based Costing Expense Report, by Course and Major



Source: Anguiano, Maria. 2013. *Cost Structure of Post-Secondary Education: Guide to Making Activity-Based Costing Meaningful and Practical*. Seattle: Bill & Melinda Gates Foundation.

8 http://yourbusiness.azcentral.com/types-businesses-activitybased-costing-28437.html

9 There are two ways to create time estimates: managerial assessment (in which deans or department heads estimate the percentage of time staff spend on each identified activity), and faculty/staff surveys of time use. Managerial assessment provides a relatively efficient and cost-effective process for generating estimates marked by "rough accuracy" rather than precision. Faculty and staff surveys are comparatively burdensome, and may yield lower quality data and foster negative attitudes toward activity-based costing, thus jeopardizing staff buy-in. Moreover, institutions may need to employ dedicated staff just to manage survey data collection, processing, and reporting.

Activity-based costing also may be used to distribute the indirect costs of non-academic units (e.g., institutional support, technology, library services) to specific academic units (divisions or courses) based on usage, thereby decreasing general overhead and providing a more accurate representation of divisional or course-related costs. To simplify, one may exclude indirect costs, such as electricity and use of buildings and equipment, but in a more expansive approach, assigning these to activities provides a more complete measure of activity costs. Figure 4 provides an illustrative example of the direct and indirect costs for a detailed cost accounting model examining specific courses, which are then aggregated to illustrate total expenses by major.

The advantage of activity-based costing is that it provides a more accurate estimate of production costs. It identifies who or what is driving costs. Improved transparency may also lead to better stewardship of spending. But foremost, this is a cost-analysis and decision-making tool intended to provide a better understanding of cost drivers and inform resource allocation decisions; it does not replace traditional cost accounting. Activity-based costing can be expensive and time-consuming to implement. Detailed cost accounting requires extensive data collection and manipulation, which is often complicated by the different campus systems that house financial, course, and facilities information.

Given the challenges associated with implementing activity-based costing, it has experienced limited adoption. Four universities appear to have made ongoing use of it, and the Gates-supported activity-based costing pilot had a cohort of 26 community colleges. However, universities in Australia successfully implemented a similar costing methodology many years ago, which also includes predictive models to assist in strategic planning. And new financial software is available that may help overcome data-related challenges and burdens (Anguiano 2013).

Administrative data systems and their use in resource allocation and management

More detailed, and more widely available, administrative data provides new ways for stakeholders to allocate resources and then better understand the ways in which they are deployed to achieve an institution's mission. Because these systems typically contain data at the student, faculty, and course level, they can be used to generate estimates of cost that are potentially more precise than those generated from managerial surveys.

Typically, state higher education leaders employ administrative-data-based solutions, not to establish the true (or actual) cost of production, but to construct funding or budgeting methodologies that rely upon notional costs. For example, the Louisiana Board of Regents employs a fairly complex budgeting methodology built upon total student credit hour production by academic term/year, institution, classification of instructional programs (CIP) code, and student level, and is then weighted by notional academic program cost differences obtained from the Texas Higher Education Coordinating Board.[10] While the Regents' model (largely) allocates state appropriations to public higher education institutions on the basis of a cost model that is heavily informed by "true" administrative data, it does not purport that the model captures the actual cost of campus activities and programs. To the extent the information resources and incentives to create true cost estimates exist, these are to be found on campuses themselves.

An example of improved costing can be found in implementations of "responsibility centered management" (RCM), an increasingly common approach to campus budgeting. Typically, colleges and universities build budgets incrementally (that is, prior year plus a percentage increase or decrease), or via simple funding formulas, both of which are centrally driven and lack incentives for improving efficiency. RCM allocates revenues and costs to academic units, the aim of which is to create incentives for increased financial respon-

10 The Texas methodology is described at http://www.thecb.state.tx.us/reports/pdf/2185.pdf.

sibility. It includes both direct costs and revenues that are typically known to units, as well as the indirect costs for which there is often an incomplete accounting. The result, at least in theory, is an accurate net cost associated with each major program and activity across the institution.

We distinguish between the principle of RCM as a management tool and the data and analytical capabilities that RCM implementation can provide. Our focus is not whether units within a university *should be* responsible for revenues and expenditures (i.e., "each tub on its bottom"), but rather how techniques associated with RCM might be used to advance campus-level information about costs. Institutions with RCM-level cost information have the potential to develop cost estimates for different student curriculum profiles: for example, the cost to educate a bachelor's-level electrical engineer. From there, constructing profiles for other student groups, such as Pell Grant recipients, first-generation students, or other populations of interest, may be possible.

To the extent that programs, services, and supports can be accurately costed, and their effects on important student outcomes such as progression and completion correctly identified, it would be possible for campus leaders to receive accurate estimates of the additional resources needed to improve outcomes for specific student groups to specific levels. Moving beyond the institutional level, we can envision that an evidence-based understanding of costs to raise the completion probability for a first-generation student in engineering would provide an empirical basis for system and state budgeting policy, including discussions of equitable resource allocation and funding adequacy within a state's higher education system, and smarter formula-based funding formulae.

NEXT STEPS

We do not presume this effort would be simple. On most campuses, neither the requisite costing data nor the information about the efficacy of programs and services are widely available, if at all. However, it is not hard to imagine a path forward. Improvements in campus data systems, as well as efforts like RCM, make it increasingly likely that well-resourced institutions will soon have the capacity to have a more complete understanding of costs to operate all parts of the educational enterprise. Similarly, more rigorous evidence about the effectiveness of various interventions *is* coming, albeit slowly.

Needed now is a coalition of institutions interested in a further exploration of these concepts. Whether they are motivated by increasing the efficiency of resource allocation, fostering a sense of fiduciary responsibility within individual campus units, or monitoring the equitable distribution of tuition and tax dollars, or some combination, this coalition would have the potential to make substantial contributions to the field of higher education finance. Many of the organizational models needed to support this work, including data-sharing consortia and topically driven research alliances, already exist. With the need for more and better information as important now as ever before, the time is right for institutional leaders (and those who support them) to move forward.

References

Anguiano, Maria. 2013. *Cost Structure of Post-Secondary Education: Guide to Making Activity-Based Costing Meaningful and Practical*. Seattle: Bill & Melinda Gates Foundation. http://www.pilbaragroup.com/Portals/0/Cost%20Structure%20of%20Post-Secondary%20Education%20-%20Practical%20Guide.pdf.

Basu Conger, Shamila, Alli Bell, and Jeff Stanley. 2010. *Four-State Cost Study*. Boulder, CO: State Higher Education Executive Officers. http://www.sheeo.org/sites/default/files/publications/SHEEO_Cost%20Study%20Report_2010.pdf.

Hurlburt, Steven, Rita Kirshstein, and Patrick Rossol-Allison. 2014. *The ABCs of Activity-Based Costing in Community Colleges*. Washington, DC: American Institutes for Research and Johnson County Community College. https://maximizingresources.org/files/The%20ABCs%20of%20Activity-Based%20Costing%20in%20Community%20Colleges.pdf.

Inside Higher Ed. 2014a. The 2014 Inside Higher Ed *Survey of College and University Presidents*. Washington, DC: *Inside Higher Ed* and Gallup.

Inside Higher Ed. 2014b. The 2014 Inside Higher Ed *Survey of College and University Business Officers*. Washington, DC: *Inside Higher Ed* and Gallup.

Johnson, Nate. 2009. *What Does a College Degree Cost? Comparing Approaches to Measuring "Cost Per Degree."* Washington, DC: Delta Cost Project. http://www.deltacostproject.org/sites/default/files/products/johnson3-09_WP.pdf.

Financial Data at the Crossroads of Cost Containment and Educational Innovation

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INTRODUCTION

The imperative facing higher education as an industry is widely understood and agreed upon, generally if not specifically: The enterprise must (substantially) increase the number of students it graduates with high-quality postsecondary credentials. Well-reasoned analyses suggest that about 60 percent of the nation's working-age population must have knowledge and skills at a level obtained through education beyond high school if the country is to remain economically competitive (the current attainment rate is about 40 percent). Achieving this will require graduating about 20 million more students by 2025 than the current attainment rate.

These heightened expectations will need to be met within the constraints of very limited resources. Neither state governments nor students, the sources of funds for general institutional operations, can be relied upon to provide resources at levels commensurate with the increased numbers of students that must be served. Public funds will be limited by both an unwillingness to raise taxes (and in many states, an appetite for reducing them) and the competing demands for available resources. The rapidly escalating costs of Medicaid represent the largest threat to education funding.

With regard to funding from students, the reality is that the additional students who must be served will be those from families with very limited means. Participation rates of low-income students are historically lower than students from high-income families and their completion rates are similarly lower. Students from the lower half of the income distribution have about a 25 percent chance of attaining a baccalaureate level degree by age 24, compared to about 90 percent of students from the upper quartile of family income. Continually raising tuition will serve to make postsecondary education unaffordable to the very students who must be brought into the system if attainment levels are to be reached. The alternative is to increase funding levels of the student financial aid system to levels that will be unsustainable.

There are no simple, silver-bullet approaches to reconciling these conflicting pressures. To be sure, there are still efficiencies that can be wrung out of the system, even after the steps taken as a result of the pressures imposed by the Great Recession. Purchasing cooperatives for energy, property insurance, and various commodities are still the exception rather than the rule, as is centralization of back-office operations. And, while some "administrative bloat" can be eliminated, the requirements of revenue-raising from a broader array of sources and the substitution of "administrative" professionals for faculty in the provision of many

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services (e.g., advising and counseling) make the amount of such bloat more apparent than real. But none of these steps, even if pushed to the limits, will free enough resources to cover more than a fraction of the funds needed to pay for the demands of increased student access and success. Increased system productivity will simply *have to be* a major part of the solution.

This reality has important implications for higher education, with regard to both public accountability and internal strategic management.

External audiences will push even harder for improvements in productivity. Given the penchant for state expenditure controls and the growing expectation that investments in higher education should yield better results, expectations of greater productivity are not unreasonable; there is plenty of room to increase the proportion of college enrollees who successfully complete a program of study.

Internally, more and more institutional leaders will be forced to recognize that their existing education and business models are simply not sustainable. They will have to modify their approaches in ways that maintain the educational integrity of their institutions while adjusting to the harsher environment in which they must function. This will require not only better financial data, but better information about factors that affect student success.

The balance of this paper is devoted to a discussion of the data needed for both public accountability and strategic management, and the degree to which these data are, and are not, generally available.

The General Data/Information Implications

These conditions directly affect the data and information required for both public accountability and institutional strategic management.

Public accountability will require institutions (and systems of institutions) to provide evidence they are responding to public demands for both increased productivity and assurances that affordability is being sustained. In short, cost containment and more effective use of resources from the perspective of both students and institutions will become more important.

Strategic management will require that institutions have ready access to information that:

1. Helps them identify barriers to student success
2. Allows them to make informed choices about changes to their education models to help them fulfill their missions at lower costs
3. Provides a basis for assessing the effectiveness of strategies regarding expenditures of institutional resources for student financial aid (or knowingly reducing revenues through tuition waivers), a major factor in the cost equation for most independent and many public institutions. Do recipients stay enrolled or graduate at higher rates than non-recipients? To what extent do the (marginal) collected revenues exceed the institution's student financial aid investment?

In some areas supporting data are available, but they are not routinely converted into information usable to decision makers. In other areas, the required data are not being captured. Each circumstance is described below.

Areas where data are available but conventions for creating information are missing

In some of these areas the necessary data are available; needed are conventions concerning the conversion of these data into information decision makers (and the public) will find useful. In this category are the following:

1. **Presenting information about institutional or system productivity.** Metrics in this arena have been proposed by the National Governors Association and are being used in several applications, accountability reporting, outcomes-based funding models, etc.
   - Number of awards (degrees and certificates) per $100,000 of general operating revenues (tuition and fees, plus state and local appropriations)
   - Number of awards per 100 full-time equivalent (FTE) enrollments (separately for undergraduate and graduate students)

   Both of these metrics become more meaningful if they are shown as trends and/or displayed in comparison to other institutions having generally similar missions. As stated, the first of these metrics treat all awards as being of equal value. This problem can be overcome by establishing a convention for weighting different kinds of awards differently (see Table 1 for example).

Table 1. Sample Weighting of Certificates and Degrees

	CERTIFICATES	ASSOCIATE	BACCALAUREATE	MASTER'S	DOCTORAL & FIRST PROFESSIONAL	TOTAL
Number	20	20	20	20	20	100
Weight	*0.25*	*0.5*	*1.0*	*2.0*	*3.0*	
Weighted number	5	10	20	40	60	135

   There will always be pressure to refine the metrics, but metrics already exist that are perfectly adequate for communicating about productivity. To the extent that there is a flaw in this metric, it revolves around the absence of data about students who transfer before completing a program. For most institutions, use of National Clearinghouse (NSC) data can overcome this shortcoming.

   The clearinghouse compiles data from most higher education institutions about the large majority of students in ways allowing students to be tracked from one institution to another. NSC data also identify when and from which institutions students earn degrees. As a result, it is possible to create a productivity metric that counts, not only graduates, but also students who successfully transfer as successes.

2. **Data that allow identification of barriers to student success.** Most institutions now have longitudinal student tracking systems (or at least the capacity to create them). These systems can identify the point at which students drop out. Emerging experience with data analytics provide evidence that thoughtful analyses of data available in institutional record systems can provide useful insights into the barriers to student success, bottleneck courses, failure to make the transition from developmental education to collegiate level work, financial problems indicated by students who leave while in good academic standing, etc.

3. **Data that allow assessment of the efficacy of institutional financial aid strategies.** The same longitudinal student tracking data systems that help identify barriers to student success can be used to track retention and completion of students who are granted institutional aid compared with those who are not. Knowing this, marginal revenues associated with recipients can be compared with institutional costs of providing aid to these students, and a reasonable approximation to return on investment (ROI) calculated.

Data that are not readily available

There are other key areas where data limitations preclude creating information that is critically important to the accountability and strategic decision-making processes. For accountability purposes, the absence of data about affordability that can be presented in a way that truly communicates the concept is a major impediment. For institutional leaders, the lack of data about the distribution of personnel time, and therefore costs, across the various activities that comprise the instructional function constrains their ability to make informed decisions about more cost-effective ways to provide education. It is in these two areas where greater attention and more work are particularly crucial. Both are discussed below.

With regard to affordability, the root problem is the absence of a convention, a widely accepted algorithm, for constructing a metric that adequately reflects the concept. At heart, the construct can be conceived as a) the costs to be borne by the student, and b) relative to the students' ability to pay those costs. The difficulties arise to a considerable extent because the specifics of the calculation are so highly individualized.

Conceptually, the cost to the student = *cost of attendance - grant aid from all sources*

The cost of attendance is relatively simple. Ways can be found to standardize this calculation given an institution's sticker price. Determining an appropriate value for grant aid is much more difficult. The summary data available from IPEDS are deficient in at least two important ways:

- They reflect aid to first-year students only. Given common aid packaging strategies, it is likely that grants are a smaller component of the package in subsequent years. Data that would allow a reasonable estimate of grant aid over the course of a college career are simply not available.
- They do not provide information on the socioeconomic characteristics of students receiving this aid. More specifically, the data provide no information about the distribution of grant aid across students in different quartiles (quintiles, deciles) of family income. Since affordability is determined as cost to the student in relation to student resources available to meet those costs, the inability to compile student cost data by family income makes calculation of a meaningful metric of affordability metric almost impossible.

The other major area of data insufficiency is in the area of costs associated with different instructional activities. For almost all institutions, the primary costs of serving students are personnel costs. As a consequence, a manager's ability to make informed choices regarding ways to contain costs while maintaining the effectiveness and integrity of the educational process requires data about the amounts of human resources (of various kinds) devoted to different instructional activities.

Table 2 depicts, in simple form, the array of data about courses or programs needed as a starting point for any decisions about changing at least some portion of an institution's education model.

Table 2. Course/Program Data Needed for Changes to Education Model

	PROGRAM DESIGN	MATERIAL DEVELOPMENT	CONTENT DELIVERY	MEDIATION	ASSESSMENT	STUDENT SUPPORT SERVICES	TOTAL
Full-Time Faculty							
Part-Time Faculty							
Students							
Professional Staff							
Other Employees							
Technology							
Vendors							

Entries are FTEs

Cost containment requires that either a) personnel costs be reduced or b) costs be distributed over more students, thereby increasing the scale (number of students served without adding costs).

Institutions have generally sought to contain costs by substituting part-time for full-time faculty. They have lowered the costs of inputs but not fundamentally changed their educational (or business) models; part-time faculty perform the same, full array of instructional activities as their full-time counterparts.

With no change in the delivery model, it is straightforward to calculate the costs of teaching a course/section using part-time rather than full-time faculty. But there are limits to how far this substitution strategy can continue before quality suffers and academic support functions go undone. And, even if carried to the responsible limits, it is unlikely cost savings would be sufficient to offset declines in state funding, and to ensure tuition increases can be minimized.

The typical attempt to reduce costs by substituting part-time faculty for full-time faculty could result in a distribution of personnel time across activities as illustrated in Table 3.

Table 3. Example Allocation of Resources in a Traditional Model

	PROGRAM DESIGN	MATERIAL DEVELOPMENT	CONTENT DELIVERY	MEDIATION	ASSESSMENT	STUDENT SUPPORT SERVICES	TOTAL
Full-Time Faculty	1	1	3	3	1	1	10
Part-Time Faculty	1	1	8	8	2	0	20
Students							
Professional Staff						2	2
Other Employees							
Technology							
Vendors							

There are numerous examples of alternative delivery models, among them:

- The large-section models, widely used by research universities, in which (graduate) student effort is substituted for full-time faculty in the tutoring/discussion class and assessment (grading) activities. This is the most common and accepted form of "unbundling" the instructional function.
- Online education which takes the large lecture model one step further and substitutes technology for full-time faculty in the actual delivery of content. Frequently missed (or mishandled) in cost calculations of this modality are the amortized costs of creating and maintaining necessary course materials.
- Competency-based education in which faculty effort is concentrated on course and assessment design, and other instructional activities are conducted by part-time faculty, professional staff, or vendors.

The list of combinations of these strategies could go on.

While individual institutions have undertaken to compare the costs of these alternative educational strategies, the ability to compile findings in a reasonably comparable way is totally lacking. As a result, there has emerged no "conventional wisdom" about costs of alternative models, and the scale or other circumstances that make them particularly attractive.

Full-blown cost studies of alternative models can be time-consuming and expensive. An alternative is to create a heuristic model that allows estimating the costs of alternative models with sufficient fidelity to support strategic decision making. Base cost calculations require assignment of values to the following factors:

- FTE numbers of each type of personnel assigned to each activity
- Average price per unit (FTE) for each type of staff
- Costs of services purchased from outside vendors
- Scale, number of students served in the course/program
- Revenue per student served

With this short list of data elements, values for which can be either determined or assigned (by policy) in a straightforward manner, it is possible to calculate the economic consequences of:

- Employing a wide variety of alternative means of education delivery, including traditional face-to-face classroom instruction.
- Operating at different scales and answering the question, "What scale has to be attained to make each model economically viable?"

The areas in which data gleaned from existing education providers in less traditional ways are the distribution of personnel effort across instructional activities, scale, and expenditures on purchased services and materials. Once there is a body of data on these factors, it is likely that commonalities/central tendencies will be found that are sufficiently sound to allow heuristic modeling without the need for further data collection.

Table 4. Example Allocation of Resources Under New Delivery Model

	PROGRAM DESIGN	MATERIAL DEVELOPMENT	CONTENT DELIVERY	MEDIATION	ASSESSMENT	STUDENT SUPPORT SERVICES	TOTAL
Full-Time Faculty	2	1			2		5
Part-Time Faculty				10			10
Students							
Professional Staff						4	4
Other Employees			1				1
Technology			$				
Vendors		$			$		

In summary, some of the data key to responsible accountability practices and effective managerial decision making are simply not available on a routine basis. The environment in which colleges and universities will have to function demand that these data come to the fore. Equally important, this paper points to the fact that many of the needed data elements are available; they just need to be deployed in a (standardized) way that allows meaningful and accurate interpretations to be drawn from them. Table 4 illustrates how the resulting allocation of resources to activities can be very different using this delivery model.

Key Challenges in Higher Education: An Economic Models Perspective

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INTRODUCTION

Caught in the crosshairs of public opinion about the value of higher education, and the debate over who should pay and how much, America's colleges and universities are facing the need to develop new financial operating models.

From complex public research institutions to small private, community, and technical colleges, all are encountering continuing reductions in public appropriations. In addition to the well-publicized announcement by Governor Scott Walker of Wisconsin, governors in Illinois, Louisiana, Arizona, Kansas, West Virginia, and Ohio, in just the first two months of last year, called for budget cuts to their public colleges and universities.

Customers are also more unwilling and/or unable to pay ever-increasing tuition and fees. Nonetheless, tuition and fees are being raised, again. Arizona, among many other states, has approved statutory changes making its largest community colleges ineligible for state funding. In Louisiana, university leaders have been discussing bankruptcy and fiscal exigency.

In addition, students are not the only ones to bear the effect of state divestment. Faculty and staff have been subject to layoffs, hiring freezes, furloughs, and reductions in pay, as this labor-intensive industry tightens its ever-shrinking belt.

While last decade's recession accounted for a part of this funding decline, this trend of state funding reductions for public state colleges and universities began over 25 years ago. And, despite a slowly improving economy, state appropriations for colleges and universities declined an average of $2,016 per student between 2008 and 2014, while tuition increased by almost the same amount.

This has occurred simultaneously with increased public questioning of the value of higher education, particularly when compared with the debt burden many students are incurring. This value question has also raised considerable debate about what the outcomes of higher education should be, and what metrics should be used in an increasingly market-driven industry (Brenneman 2005). As Vedder (2004) explains in his analysis of the high cost and inefficiency of colleges, "there is no clear, unambiguous means of measuring success" (37).

While some believe the longevity of the higher education industry evidences continued need for current

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models and methods (recall the results of similar assumptions made by the American automobile and steel industries of the past century), others assert that emerging models of higher education (including competency-based credentialing, "badging," and open courseware) will replace current institutions within the next decade.

In response to the need for campus-wide discussion of these issues, the National Association for College and University Business Officers (NACUBO) has embarked on a two-year project titled the NACUBO Higher Education Economic Models Project. The project will neither attempt to resolve the public-good versus private-good debate about higher education, nor focus on institutions' revenues and who should contribute what shares. Rather, the project examines the effect of the current economic, political, and social environment on colleges and universities, and examines the internal structural, operational, and cultural variables critical to their success.

The outcome of the project is not intended to be prescriptive in its approach, but to provide higher education leaders with recommended discussion points and methods to engender needed changes. Thus, we propose solutions from *within* these institutions of higher education, led by those who know them best (faculty, staff, administration, and board members), and focus on methods for implementing those changes.

Given the diversity of institutions' environments, missions, market segments, and "customers" in the higher education industry, we anticipate different and unique solutions will be forthcoming for different institutions. As Arizona State University President Michael Crow has stated, academic entrepreneurship, "the process of innovation and spirit of creative risk-taking," will be a critical attribute to change (Crow 2012, 21).

While institutional researchers and others have attempted to explain the economic underpinnings of higher education, as in the Delta Cost Project, their work has focused largely on macro-, industry-level data. The lack of models of higher education cost functions, combined with the diversity of institutions, pose challenges to development of elegant institutionally focused economic models.

However, factors affecting institutions' ability to respond to environmental changes can be discerned from thoughtful, experienced industry leaders. Consequently, NACUBO has begun by asking an array of stakeholders, including board members, presidents, provosts and chief academic officers (CAOs), chief business officers (CBOs), and others to identify those factors.

The succeeding discussion reflects the input from initial focus groups with such higher education stakeholders about the challenges and opportunities of changing financial and operational models currently used by colleges and universities.

Key finding: It's all about leadership

Initial focus groups have represented the range of nonprofit higher education institutions: research, comprehensive doctoral, small institutions, and community colleges. Responses collected to date have centered around four themes: institutional leadership, strategic resource deployment, a labor-intensive organization, and capital resources. While each of the themes can be described independently, they reflect highly interrelated aspects of a complex industry comprising complex institutions. From a series of focus group discussions with chief business officers, provosts, presidents, board members, and chief information officers, we have identified four key areas of concern around the current higher education economic model: resource allocation, labor dependence, capital, and leadership. In ensuing discussions, leadership emerged as the priority.

Embedded in the leadership topic are the dimensions of organizational structure, decision making, and culture that imbue higher education with both its collegial and shared governance, as well as its tradi-

tion-bound nature. Combined with a vertical organizational structure and competing outcomes, these create an atmosphere of reluctant change (and then, change only at the margins), as well as leaders who fear votes of no confidence from faculty and/or boards should they dare to innovate.

Institutional leadership

Leadership can make the difference between an adaptive, mission-centered, effective, and efficient organization, and one that simply maintains the status quo. The role of leadership in colleges and universities, however, is complicated by institutional culture, once described as both shared governance and organized anarchy (Cohen, March, and Olsen 1972).

These contradictory views reflect the differing perspectives of intent and execution. While shared governance views the decision-making processes of higher education as collaborative and deliberative, in many cases the framework yields a governance structure that separates outcomes (academics, generally the purview of the faculty senate) from resource means, managed by the administration (Halachmi 2001). Within this messy organization, "higher education leadership can be considered an extreme profession equivalent to extreme sports" (Mossberg 2001, 206). As is often the case in sports, success will depend on the strengths, talents, and commitment of the entire team—in this case, the institutional leadership team of president, CAO, and CBO. The team must also share a vision for the institution and accept the necessity of taking risks to create its sustainable future.

While data cannot resolve such deeply rooted cultural and structural issues, development of agreed-upon, institution-wide metrics can provide common ground for constituents to identify and discuss needed changes. Shared metrics, quantitative and qualitative, provide key input into strategic thinking about the institution's areas of excellence that may serve as the foundation for institutional change. They also facilitate participation across the organization in development and alignment of strategic actions.

CBOs increasingly find themselves spending time developing communications for wider ranges of institutional constituents, including more time educating an institution's faculty and staff. This requires development of metrics that link operations to institutional performance.

Further, institutional leaders need to understand the interrelationships of the analytics and their relevancy to varying audiences. For example, while the board of trustees may be concerned about figures as they appear on the year-end financial reports, deans and department chairs need timely operational metrics that support their daily decision making, and individuals throughout the organization need to regularly see the results of goals and progress towards reaching them.

One university president has suggested that a financial dashboard appear on every college home page; perhaps this could be augmented with a shared, transparent progress report on institutional metrics. With such transparency, however, comes the potential for increased external political influence and constraints, further reinforcing the need for leadership alignment.

Equally critical to the establishment of metrics is the incorporation of quality into the discussion of institutional effectiveness. Quality is, of course, a much more complex and nuanced concept than efficiency; but, it is the superordinate goal of education. One key dimension of quality is student learning, and, as the learning college movement has demonstrated, student success should be measured by the depth and breadth of student learning, not by input measures of instruction.

Strategic resource deployment

A second challenge to economic sustainability, identified by business officers, is that of strategic resource deployment. Colleges and universities, as with many other bureaucratic institutions, have long relied upon

traditional budgeting and planning methods. Financial planning processes are generally lengthy, beginning long before the commencement of the fiscal year, and collaborative. Largely incremental and linear, these processes rarely examine past assumptions or unanticipated outcomes, and treat the future merely as an extrapolation of the past. It is rare for colleges and universities to undertake "shifts in resources, year after year, in pursuit of a clear strategy" (Fruk, Hall, and Mittal 2013).

While college and university leaders have had the opportunity—some would say the mandate—to make changes in resource allocations and the underlying business model in response to the changing economic environment of the past decade, few have done so. Instead, they continue to focus on net revenue management (at least, in the past few years moving beyond tuition discounting) and methods to increase enrollment. Citing this dependence on short-term fixes rather than long-term strategies, retired Bucknell University (PA) President Brian C. Mitchell predicts that additional external shocks are necessary before board members and administrators are willing to make necessary changes.

Current Dartmouth University (NH) President Philip J. Hanlon agrees the impetus for change must be from the outside "because presidents at higher education institutions have learned to be cautious" (Shea 2015, 20).

Another factor limiting colleges and universities in moving to more informative financial operations is the absence of useful information. While colleges and universities have abundant data about students, employees, and finances, their capabilities and tools to perform sophisticated analytics informing decision making are more rare, frequently because financial management has focused on transactional processing and reporting. The absence of leadership focus, and a distrustful culture that questions the accuracy and utility of administratively provided numbers, exacerbate this data vacuum. Additionally, cost is often cited as a barrier—both the cost of tools and the cost of analytics that professionals need to transform mounds of data into answers for strategic decisions.

A 2012 study by the EDUCAUSE Center for Applied Research determined that institutions viewing analytics as an investment were progressing faster than institutions viewing it as an expense. The report further identified the need to focus on "expertise, process and policies before acquiring new tools or collecting additional data" (Richsel 2012, 4).

Although most higher education institutions have well-equipped institutional researchers to analyze student data, these researchers frequently lack expertise and training in using financial data. As a result, higher education institutions frequently lack the methods to present timely information to administrators and boards—the norm in other industries. Consequently, a key recommended practice is assembling a cross-section of institutional functional leaders and administrators, in addition to technical talent from information technology and institutional research.

Higher education also lacks cost functions, resulting in "almost a complete lack of transparency regarding the actual cost to deliver post-secondary education, and how those costs compare with the outcomes achieved." (Anguiano 2013, 3). Since many faculty engage in both instruction and research (and possibly administration and service) sometimes concurrently, this multiplicity and overlapping nature of functions creates difficulty in discerning the costs of either, and arguments over the amount and the appropriateness of cross-subsidization abound. As a result, some, such as David Breneman (2001), argue that the complex joint production functions of university activities make cost allocations and internal cost analysis a political rather than an informative financial exercise.

New approaches are being tested and tried at some institutions. These include activity-based costing, responsibility-centered budgeting (also termed responsibility-centered management), and program prioritization. While activity-based costing is gaining some attention, as in the Maximizing Resources for Student Success project at Johnson County Community College (KS), and responsibility-centered management

(RCM) has enabled some institutions (generally larger, research universities) to tie resources to the activity that generated the revenue, neither process focuses on setting institutional priorities and strategically deploying resources to accomplish them.

First discussed in the 1980s in the manufacturing sector, activity-based costing is an attempt to better match resources with an organization's activities, and link those activities to outputs. The Maximizing Resources for Student Success project, for example, focuses on collecting data on the costs of instructional and student services to provide community colleges with comparison benchmarks. Ultimately, the project intends to facilitate better understanding of institutional cost drivers' effect on student success outcomes. Maria Anguiano's 2013 paper on the cost structure of postsecondary education demonstrates the potential of activity-based costing to improve institutional planning and decision making, while noting its limited use in U.S. universities. She notes that the emphasis on outcomes measurement has neglected assessment of the cost of attaining those outcomes, something activity-based costing can provide.

At the research university level, RCM has been the more common response to the need to enhance resource deployment strategies. RCM is an incentive-based budgeting system, often referred to as "each tub on its own bottom." Under RCM, each unit is credited with its own revenue (from tuition, research, etc.) to cover its operational expenses. Central costs, such as those of the president's office and the business office, as well as costs of facilities, are allocated to the unit, and unit leadership is charged with managing its financial bottom line, making each unit a potential "profit center." The goal is to incent efficient decisions regarding resource usage via local control. With local control, however, comes potential loss of focus on and sub-optimization of institutional priorities.

Most recently, program prioritization has garnered interest as a methodology to reallocate resources in colleges and universities. In 1999, Robert Dickeson proposed that—with new resources dwindling and pressure growing to reduce costs and increase accountability—it was incumbent upon institutions to critically examine existing programs and services to identify strategic priorities. This process, which includes assessment of quality and mission focus, expanded the parameters of resource allocation beyond merely quantitative and financial ones. While there are examples of success in applying Dickeson's methodology, there are also institutions whose leaders have lacked the will to make the tough decisions required.

Labor-intensive organization

A third challenge to institutional change is the labor-intensive nature of higher education. The complexities of the multiversity are reflected in the multi-faceted roles played by employees, particularly by faculty, and particularly by faculty who are evaluated based on teaching, research, and service contributions. As described above, this bundled but synergistic set of roles complicates attempts to understand the cost of any one. Faculty autonomy and generally decentralized organizations further complicate examination of the complexity of joint costs and products. Staff roles have also expanded as an institution's "standard of care" (Archibald and Feldman 2011, 76) grows to meet increasing expectations from students, potential students, and their parents.

For many colleges and universities, compensation constitutes 70 percent, or more, of their operating budgets (Davis Educational Foundation 2012). For more than 800 years, higher education has been organized around a group of students taught by a learned faculty member. While other industries have availed themselves of technology to expand capacity and capability of their delivery models, higher education has largely used technology to supplement, not supplant, its traditional teaching modes. Rather than fundamentally altering the parameters for workload and compensation, online and hybrid courses have simply been integrated into existing models. While the faculty role as teacher continues, other roles formerly ascribed to faculty members have evolved to become professional staff roles.

In the 1970s and 80s, the number of professional positions and staff increased, both in response to the seemingly limitless growth of higher education institutions, as well as the changing role of faculty. Faculty divested themselves of institution-centric roles, as their focus became more discipline-centric, and more time was required for increased scholarship and research (Zemsky, Wegner, and Massy 2005). In the last two decades these professional roles have expanded yet again (per Desrochers and Wellman, by nearly 40 percent in research universities and 100 percent in master's and bachelor's degree-granting institutions).

Some new staff roles were developed to address the needs of increasingly underprepared or first-generation college students. In the inter-institutional competition for students, other staff play "high touch" roles; still other roles have been created by the growing enrollment management industry. They also serve the ever-increasing need for development of new revenue streams. Yet others are the result of the further unbundling of the faculty role resulting from the growth of online education, where tasks ranging from curriculum development to instructional design and delivery are performed in a "virtual assembly line" (Smith 2010, 50).

Also affecting the growth in staffing at colleges and universities is the environment of ever-increasing regulation. This was highlighted in the recently released report of the Task Force on the Regulation of Higher Education (2015). Data cited from work by the Mercatus Center at George Mason University (VA) shows a 56 percent increase in regulations from 1997 to 2012, the result of which is to "require colleges to become expert in unfamiliar topics or to hire outside consultants with such expertise" (Task Force on the Regulation of Higher Education 2015, 13).

The labor-intensive, "labor expensive" nature of higher education exacerbates the leadership challenge. Tenure, (particularly in institutions lacking meaningful post-tenure review systems), combined with shared governance, can complicate and prolong decision making about program life cycles and associated resource allocation requirements. Attempts to focus on mission and institutional niche can conflict with the tendency to proliferate programs and the absence of protocols to sunset programs or services. The vertical, siloed structure of colleges and universities places additional demand for strategic and operational alignment in the leadership team.

Capital requirements

Capital is the fourth challenge identified by CBOs to financial sustainability. For many years, public colleges and universities could rely on separate state allocations for capital. These funds supported the rapid growth of brick and mortar campuses following World War II, and during the construction boom of the 1990s. However, just as those buildings are approaching critical needs for renewal (Sightlines 2013), state funding is diminishing. Capital requirements for equipment, particularly to support growing technology systems and networks, compound these resource needs.

In 2012, *The Chronicle of Higher Education* estimated that, nationwide, colleges and universities had accumulated deferred maintenance of $36 billion. In addition to the immediate effect of building system obsolescence on operating budgets, Rick Biedenweg, former assistant vice president of information resources at Stanford University (CA), estimated that for every dollar of deferred maintenance, institutions will incur four dollars in additional renewal costs (SchoolDude 2012). These costs are in addition to the funds colleges and universities are currently investing in new facilities. Whether investing in new dorms, fitness centers, and student unions to attract students, new research facilities to attract faculty, or new athletic arenas and stadiums to attract alums, a "facilities arms race" is underway at many institutions.

Utilization of space is yet another dimension of the facilities challenge. Because it is often considered a "free resource" by users, improving space utilization requires not just encouragement and tools but changed mindsets. Efficient use of space is driven by course and activity schedules. These schedules, in turn, are

frequently driven by traditions—traditions of the two-semester academic year, traditions of 50-minute class periods and twice-weekly class meetings. But use of classrooms is quantifiable, and while no national standards exist, "campuses can improve usage by understanding the space inventory; reviewing the actual hours, days and times occupied; and analyzing the related data to formulate ways to improve" (Grans-Korsch 2013). For the intrepid leaders who take on this challenge, there are significant risks and rewards. Increased efficiency can yield substantial financial savings for traditional academic organizations willing to take on the cultural and governance conflicts of modifying schedules and calendars.

The challenge to find capital to fund equipment is also significant, particularly for colleges and universities with large science or engineering research programs or medical facilities. One equipment challenge faced by all institutions is that of technology. The pervasiveness and continuous rate of change in technology exacerbate the financial requirements in this area. While technology has been a factor in reducing costs in the production of goods, it has not been equally effective in service industries, including higher education (Archibald and Feldman 2011). Nonetheless, sophisticated technological infrastructures have become ubiquitous at colleges and universities, in research labs, in classrooms and offices, and in building infrastructures; and the rapidity of change requires continual refreshment to remain current.

While online education has been promoted as the arena in which technology may generate the most future cost savings, technological developments in building systems are currently making significant contributions to college bottom lines through energy efficient devices and controls. The future of online education as a sufficient pedagogical replacement for all or most of higher education, and all or most students, is a continued source of discussion and debate. While the future of massive open online courses (MOOCs) is uncertain, by 2012, 32 percent of higher education students were taking at least one class online. Technology is also supporting countless blended or hybrid classes and class supplementation through learning management systems. And such institutions as Arizona State University (ASU) are piloting creative approaches using systems such as edX to deliver programs. In ASU's case, the entire freshman year is online without requirements for admission or pre-payment of tuition.

While it is too early to obtain data on the success of such projects, with nearly 70 percent of CAOs reporting that online education is a critical part of their strategic plan (Seaman and Allen 2012), we can anticipate continued development of the online medium.

With the reduction (and, in some cases, elimination) of state allocations for capital, public colleges and universities are joining private institutions in identifying alternative funding streams. In addition to the traditional means of fundraising and bond financing, institutions are turning to public and private sources to finance projects. They are also examining ways to monetize existing assets as financing sources for both capital and operating needs. Institutions that have developed the most effective partnerships that have communicated their value propositions to their communities—and that have maintained strong balance sheets—will be most able to secure resources.

CONCLUSION

Leadership must play a role in the imminent changes coming to higher education. Most importantly, the president, chief academic officer, and chief business officer must be on the same page when assessing, making decisions, and implementing change on their campuses to drive changes in the economic model that lead to long-term fiscal sustainability. This higher education leadership triangle is, arguably, the most important component of the change dynamic in higher education today.

Higher education leaders, as with today's leaders in other global industries, must demonstrate an evolving

set of competencies. These include deep knowledge and understanding of the complexities of both their institutions and the industry. Beyond this, they must apply a strategic perspective to long-term viability and implement appropriate, resulting strategies to the goals and actions of their institutions. This perspective must be grounded in data and qualitative evidence which leaders must be able to translate to their teams and other constituents, and which they must use to take risks to innovate and create new institutions and economic models. The tendency within higher education to debate the numbers in "cultural data wars" needs to be addressed with transparent sharing of information and maintaining a focus on outcomes and action.

References

Allen, I. Elaine, and Jeff Seaman. 2013. *Changing Course: Ten Years of Tracking Online Education in the United States.* Babson Park, MA: Babson Survey Research Group and Quahog Research Group, LLC. http://onlinelearningconsortium.org/survey_report/changing-course-ten-years-tracking-online-education-united-states/.

Anguiano, Maria. 2013. *Cost Structure of Post-Secondary Education: Guide to Making Activity-Based Costing Meaningful and Practical.* Virginia Beach, VA: Pilbara Group. http://www.pilbaragroup.com/Portals/0/Cost%20Structure%20of%20Post-Secondary%20Education%20-%20Practical%20Guide.pdf.

Archibald, Robert B., and David H. Feldman. 2011. *Why Does College Cost So Much?* Oxford: Oxford University Press.

Bichsel, Jacqueline. 2012. *Analytics in Higher Education: Benefits, Barriers, Progress, and Recommendations.* Louisville, CO: EDUCAUSE Center for Applied Research. http://net.educause.edu/ir/library/pdf/ERS1207/ers1207.pdf.

Breneman, David W. 2001. "An Essay on College Costs." In *Study of College Costs and Prices, 1988–89 to 1997–98, Vol. 2, Commissioned Papers,* edited by Alisa F. Cunningham, Jane V. Wellman, Melissa E. Clinedinst, Jamie P. Merisotis, and C. Dennis Carroll, 13–20. Washington, DC: National Center for Educational Statistics. http://nces.ed.gov/pubs2002/2002158.pdf.

Breneman, David W. 2005. "Entrepreneurship in Higher Education." In *Arenas of Entrepreneurship: Where Nonprofit and For-Profit Institutions Compete,* edited by Brian Pusser, 3–9. San Francisco: Jossey-Bass.

Cohen, Michael D., James G. March, and Johan P. Olsen. 1972. "A Garbage Can Model of Organizational Choice." *Administrative Science Quarterly* 17 (1): 1–25.

Crow, Michael M. 2012. "Reinventing the Public Research University." In *Forum Futures,* 18–24. https://net.educause.edu/ir/library/pdf/ff1203s.pdf.

Davis Educational Foundation. 2012. "An Inquiry into the Rising Cost of Higher Education Summary of Responses from Seventy College and University Presidents." Yarmouth, ME: Davis Educational Foundation. http://www.davisfoundations.org/site/documents/AnInquiryintotheRisingCostofHigherEducation.pdf.

Desrochers, Donna M., and Jane V. Wellman. 2011. "Trends in College Spending 1999–2009. Where Does the Money Come From? Where Does It Go? What Does It Buy?" Washington, DC: Delta Cost Project. http://eric.ed.gov/?id=ED539420.

Dickeson, Robert C. 2010. *Prioritizing Academic Programs and Services: Reallocating Resources to Achieve Strategic Balance.* San Francisco: Jossey-Bass.

Fruk, Mladen, Stephen Hall, and Devesh Mittal. 2013 "Never Let a Good Crisis Go to Waste." *McKinsey Quarterly,* October. http://www.mckinsey.com/insights/strategy/never_let_a_good_crisis_go_to_waste.

Grans-Korsh, Sally. 2013. "Spatial Concepts." *Business Officer Magazine* 47 (3).

Halachmi, Arie. 2001. "The University Business in Transition: Of Stars, Cash Cows and Dogs." In *The University as a Business,* edited by Paolo Rondo-Brovetto and Iris Saliterer, 39–51. Springer VS Verlag für Sozialwissenschaften.

Harker, Patrick T. "Making Sense of Higher Education's Future: An Economics and Operations Perspective." *Science Service* 6 (4): 207–216.

Mitchell, Brian C. 2015. "Higher Education: Like a Fire Bell in the Night." *The Huffington Post,* July 27. http://www.huffingtonpost.com/dr-brian-c-mitchell/higher-education-like-a-f_b_7878304.html.

Mossberg, Barbara. 2001. "Leadership's Natural Ally: Applying Chaos and Complexity Theories." In *Chaos Theory and Higher Education,* edited by Marc Cutright, 203–248. New York: Peter Lang.

SchoolDude. 2012. "$1 Deferred Maintenance = $4 Needed Later in Capital…How Does That Math Work?" *SchoolDude Community Blogs*, June 10. https://www.schooldude.com/community/discover/blogs/-1-deferred-maintenance-4-needed-later-in-capitalhow-does-that-math-work.

Shea, Bob. 2015. "Economics in Motion: Presidential Perspectives." *Business Officer Magazine,* July/August 19–27.

Sightlines. 2013. *The State of Facilities in Higher Education: 2013 Benchmarks, Best Practices, & Trends.* Guilford, CT: Sightlines LLC. http://www.sightlines.com/wp-content/uploads/2013/10/The-State-of-Facilities-in-Higher-Education-2013-Benchmarks-Best-Practices-Trends.pdf.

Smith, Vernon C. 2010. "Essential Tasks and Skills for Online Community College Faculty." In *Online Education: New Directions for Community Colleges,* No. 150, edited by Regina L. Garza Mitchell, 43–56. San Francisco: Jossey-Bass.

Task Force on Federal Regulation of Higher Education. 2015. *Recalibrating Regulation of Colleges and Universities: Report of the Task Force on Federal Regulation of Higher Education.* Washington, DC: American Council on Education. http://www.acenet.edu/news-room/Documents/Higher-Education-Regulations-Task-Force-Report.pdf.

Vedder, Richard. 2004. *Going Broke by Degree: Why College Costs Too Much.* Washington, DC: AEI Press.

Zemsky, Robert, Gregory Wegner, and William F. Massy. 2005. *Remaking the American University: Market-Smart and Mission-Centered. Piscataway, NJ: Rutgers University Press.*

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