

The Cost-Effectiveness of Public Higher Education: Integrating Accounting and Quality to Assess Value

Gus Gordon
University of Texas at Tyler

Rising costs and concerns over quality create a perception of the diminishing value of a college degree. Value is a concept that combines both costs and quality. This paper proposes an approach to value-based measurement in higher education that captures both costs and quality so that cost-effectiveness is assessed. The proposed assessment model will have potential to demonstrate comparative value between institutions, as well as academic colleges and departments within institutions. It also has implications for policy-makers.

INTRODUCTION

The popular press and academic research is replete with criticisms of spiraling costs in higher education. Spending in higher education has increased at double the rate of healthcare (Callan 2008), yet little is known about the relationships between costs and outcomes (Massy et al 2013). Meanwhile, over the last three decades, tuition and fees have grown at about four times the rate of general inflation (SHEEO, 2017). Currently about 15% of total annual government spending is devoted to education (Hollands et al 2016).

Curiously, as higher education enrollment increased, the industry experienced a diseconomy of scale that does not occur in other industries. In recent years, enrollment increased 15%, but total per-student spending increased about 35% (Greene et al 2010).

While costs are rising at alarming rates, concerns over quality are emerging (Immerwahr 2004; Symonds 2003). Arum and Roksa (2011) demonstrate that the college experience does not improve critical thinking skills of many graduates. A recent survey of employer satisfaction found that 60% of managers believed that college graduates lack critical thinking skills (Payscale 2016). Another study shows that large blocks of college seniors are unable to properly interpret evidence and make coherent arguments (Glum 2017).

Conditions of rising costs and concerns over quality create a perception of the diminishing value of a college degree (Vedder and Strehle 2017). Long term trends of deteriorating results for costs and quality logically point to issues with the management model, or governance, including a lack accountability and continuous improvement (Guskin, 1994; Bowen, 1980; Levin 1991; Zemsky and Massey 1990; Langfitt 1990, Gordon and Fischer, 2011; Fischer and Gordon, 2016; Alach, 2017; Doost, 1998). However, nothing of substance is changing in the management or financial reporting model in higher education.

Assessing performance, defined as efficiency and effectiveness, of higher education is admittedly problematic due to the intangible nature of the primary product, education, or learning. However,

learning should not be assessed in isolation, but in conjunction with cost, so that both dimensions of cost and quality (effectiveness) are captured. Research on cost-effectiveness, defined as costs relative to impact, of specific educational programs is initiating, but little research on institutional cost-effectiveness of universities exists.

Higher education has much in common with healthcare, with respect to rising costs and concerns over cost-effectiveness. Evaluation of healthcare is also somewhat problematic due to the intangible nature of the services provided. Given the similarities in the nature of the healthcare and higher education industries, an emerging stream of research in healthcare, Value Based Healthcare Delivery (VBHD), may hold promise for higher education. In fact, Drengenberg and Bain (2017) argue that assessments of performance in higher education must be multi-variate and more expansive to include the important elements of productivity and quality.

Accordingly, the purpose of this paper is to propose and describe an approach to value-based measurement in higher education that captures both costs and quality so that cost-effectiveness is assessed. The proposed assessment model will have potential to demonstrate comparative value between institutions, as well as academic colleges and departments within institutions. The model will have important implications for policy makers and institutional administrators responsible to stakeholders for cost-effectiveness. A model that enables value comparisons can assist with the detection of cause-and-effect linkages between resource consumption and outcomes. This relationship can be used to create a performance management system for the university.

The purpose is accomplished by describing the similarities of healthcare and higher education, followed by sections on value-based healthcare and application of the value-based model to higher education. The last section discusses the implications and conclusions of the paper.

SIMILARITIES OF HEALTHCARE AND HIGHER EDUCATION

The two industries exhibit striking similarities. Structural issues in both industries are causing continuously rising costs. Costing systems in both industries are under-developed, resulting in the inability to link resource consumption to outcomes (Rahman 2015, Kaplan and Porter 2011). Outcomes in both industries are difficult to quantitatively measure given the intangible nature of the services provided. Finally, traditional incentives in both healthcare and higher education are specified for volume and growth, with little or no attention to quality and/or value.

Concerns about the costs of healthcare are legend. While many consider the United States' healthcare system as the highest-quality provider in the world, given the rate of rising costs, a question of value has emerged as a relevant consideration. Value in the healthcare context is defined as patient outcomes, relative to costs to obtain the outcome (Thaker, et al (2016).

Similarly, the U. S. system of higher education is considered by most as the best in the world, but rising costs have made value an issue. Costs in higher education are actually growing at a greater pace than costs in healthcare (Callan 2008). Management accounting systems in higher education are virtually non-existent (Rahman 2015). Consequently, universities have little, or no, understanding of costs and their linkages to outcomes.

Perverse Incentives

Under traditional reimbursement arrangements, healthcare providers are rewarded on the basis of quantity, or fee-for-service, which relate to the number of procedures, or services provided. Recognizing that the solution to rising costs may be linked to the notion of value, which captures both cost and quality, the Centers for Medicare and Medicaid Services (CMS), is experimenting with government reimbursements that use the concept of Value Based Purchasing (VBP), which rewards healthcare providers on the basis of cost-effectiveness, or value.

Likewise, in higher education the incentives are focused on volume or growth. Many states provide funding based on the number of students enrolled. Some states incentivize CEOs of universities for

growth in enrollment with the hope that increased enrollment will provide more revenues to offset shortfalls.

In higher education, such an incentive will serve to feed continued spending. Bowen (1980) hypothesized decades ago that higher education would spend all revenue, regardless of actual need. Data cited above shows that spending is growing at faster rates than enrollment which creates diseconomies of scale. The primary cause appears to be administrative spending (Greene et al 2010, Vedder 2004, Rahman 2015). Curiously, Gordon and Fischer (2014) discovered that university CEO salaries were positively correlated to non-instructional spending, which is counter intuitive given the core mission of universities.

Recently, there has been increased interest in evaluating educational programs on the basis of cost-effectiveness (McEwan 2012). However, the investigation to date is limited to intervention programs. The extant, but limited research, is meant to enable assessment of value on the basis of cost relative to impact. However, these previous analyses often focus on a single outcome, rather than multiple outcomes.

VALUE-BASED HEALTHCARE DELIVERY (VBHD) EXPLAINED

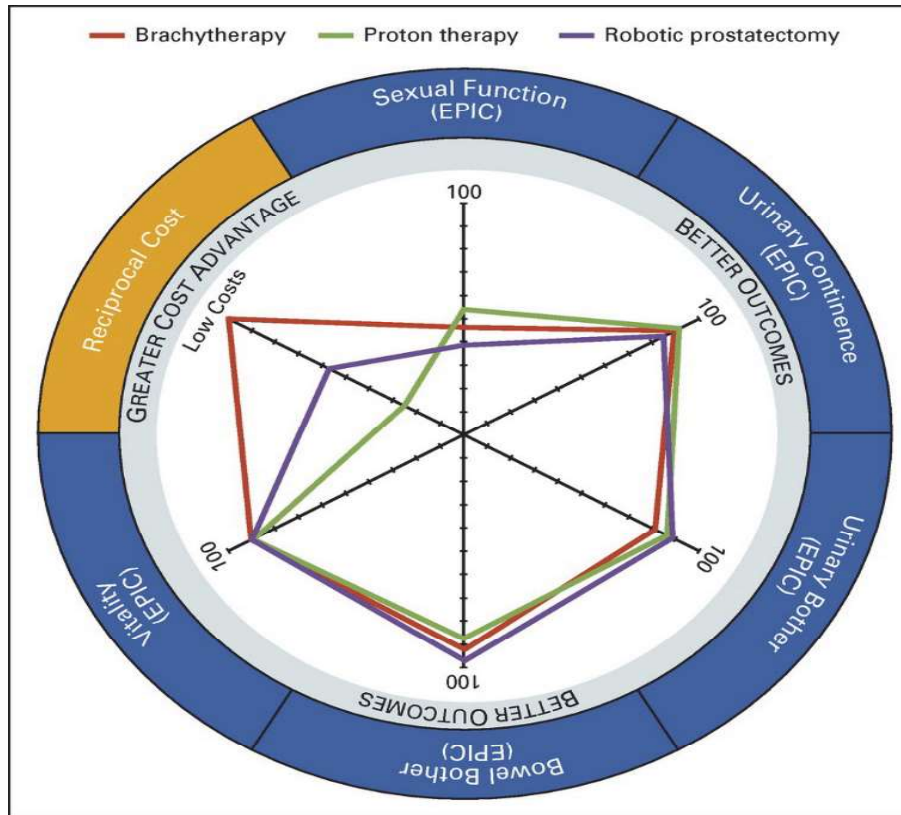
Kaplan and Porter (2011) assert that most healthcare providers have no understanding of the costs to deliver healthcare. They point out the obvious, that the lack of understanding will lead to poor management decision making, which results in ineffective and inefficient operations.

To match outcomes to costs, medical outcomes measurements for specific procedures are in existence, but usually not integrated with costs. Combining costs with outcomes enables analysis of cost-effectiveness. The result is VBHD which measures costs and outcomes at the patient level.

Multiple outcomes for a single procedure can be integrated with cost and visually portrayed in a radar chart, which displays multivariate data in two dimensions, and graphically depicts both outcome and cost data. For example, Exhibit 1 reflects the comparison of three different types of treatment for prostate cancer, with outcomes and costs for each.

The radar chart illustrates that one type of therapy, Brachytherapy, outperforms the other types in cost. The medical outcomes for the three types of therapy are relatively similar. Therefore, Brachytherapy provides greater comparative value. These results inform medical management on a number of dimensions. Exhibit 1 below is reproduced from Thaker et al (2016).

**EXHIBIT 1
VALUE-BASED COMPARISONS OF PROSTATE THERAPY**



THE VALUE-BASED MODEL ILLUSTRATED HIGHER EDUCATION

To apply a value-based model to higher education, a common understanding of what is meant by both cost and outcomes is important. Since this paper focuses on public higher education, a public good, the beginning point for determining a common understanding of outcomes would be represented by society's expectations, which implies agency considerations.

In fact, Drengenberg and Bain (2017) frame the issue as an agency issue in a professional context. By focusing on the agency of stakeholders an understanding of relevant quality will emerge in an attempt to satisfy overlapping agencies.

The public invests in higher education as a public good based on the premise that a more educated populace will add greater value to society. The core mission of universities is instruction, or teaching. Logically, outcomes should be related in some way to education, the core mission.

Since each university should be unique in some way, universities are free to specify additional expected outcomes that relate to their unique mission for purposes of internal evaluation, which might include research and service. However, without a standardized set of outcomes for use by external stakeholders, it may be difficult to compare universities. Therefore, a set of standardized outcomes are proposed below for inter-university comparisons and benchmarking.

Outcomes in higher education are often confused with outputs. For example, the number of degrees granted is often utilized as an outcome measure, when, in fact, it is a measure of productivity, or output. An outcome metric should have some relationship to quality, or effectiveness. While degree completion rates are often used as a surrogate for effectiveness, this assumes degrees from all universities are of equal

value and curriculums are of equal rigor. Therefore, degree completion is considered an output, or productivity, measure in this study.

Outcomes are to some extent impacted by inputs. For example, higher outcomes might be expected, all things equal, for students which have greater innate abilities as represented by SAT/ACT scores. Therefore, it is proposed that inputs be considered as part of the assessment of value delivered in order to normalize results.

Suggested Measures

An outcome measure is an objective result of a process or program that enables comparison to other processes or programs. The World Health Organization defines outcome measures as changes in the health of an individual or group that can be attributed to an intervention (Tinker 2017). The same concept can be applied to students and their university experience.

As an experimental study, this paper merely seeks to illustrate the possibilities and potential of value-based higher education assessment. Many different outcomes measures are valid. The ones utilized here are not suggested as the *only* possibilities, or even the *best* available measures. It is suggested that a portfolio of measures be utilized, as no one measure captures all dimensions of value.

Regarding society's expectations for outcomes, critical thinking is often considered to be an important skill for graduates to make an effective contribution to the workforce (Liu et al 2014). In fact, a recent survey of chief academic officers finds that 95% of respondents believe critical thinking is one of the most important skills for college graduates (AAC&U 2011). Furthermore, 92% of employers responded in another survey that critical thinking is a very important skill for college graduates (Cassner-Lotto and Barrington 2006).

Accordingly, a suggested outcome measure is critical thinking test results. One such test commonly used is the Critical Learning Assessment (CLA) Test (Arum and Ruksa 2011).

Another commonly used measure of outcomes for universities is employment rates. Clearly, this statistic provides information on the market's perception of the quality of graduates. Since some graduates might be employed in an area outside of their fields, i.e., employed in a fast food restaurant, or underemployed, it might be important to filter out employment in areas not associated with the graduate's degree.

A final dimension of effectiveness, is average starting salary. This measure provides another perspective on the market's perception of the value of graduates, and would take into account those graduates that are employed, but under-employed with respect to their academic training per the concerns addressed in the last paragraph.

As previously mentioned, outcomes measures can be influenced by the quality of the input. Therefore, some notion of the raw material quality could be an important consideration in evaluating effectiveness of university learning processes, and value added by the educational experience (Massy et al 2013). One such measure is average SAT or ACT scores of graduates.

Another suggested input measure is the CLA Test, as it can be given as a type of pre-test for entering students to determine beginning critical thinking aptitudes. In fact, entering scores of graduates can be compared to their scores upon graduation to measure the impact of the learning experience on critical thinking. The net change becomes an outcomes measure.

Finally, reject rates for applicants can provide insight concerning overall institutional quality. Presumably, higher reject rates would indicate greater discernment in admission policies and higher quality students. However, this measure could skew results of comparisons, since many state-supported universities essentially have open door policies. This potential weakness in comparisons could be overcome by grouping universities for comparative purposes by admission policies. Massey et al (2013) suggest that universities be segmented into homogenous groups in order to make comparisons more valid.

A possible measure of employee satisfaction, which should effect outcomes, is the Gallup Employee Engagement Survey. This survey will rank participating universities on a set of approximately 13 constructs of employee satisfaction. Research has shown a correlation to employee engagement and organizational performance (Gordon 2017).

Finally, in order to capture the cost dimension, a cost object should be determined. A valid cost object could be students, Student Credit Hours, degrees and so forth. For purposes of this paper, the cost object is defined as degrees so that the cost per degree is calculated.

Display of Results

Resulting metrics are displayed in radar charts, as in VBHD. These diagrams are used to display multivariate data in two dimensional form, as was shown earlier in Exhibit 1. The best results are represented by those farthest from the center. Results are scaled on a relative basis with the highest outcome normally scaled at 100.

This approach requires an adjustment for the cost variable because the best outcome is the lowest cost, but for all other suggested measures, the better outcome is the highest. In order to make each variable consistent in its interpretation, i. e., the best outcome for all variables is the result farthest from the center, costs must be scaled as reciprocals of their relative value (Thaker et al 2016).

For example, a cost per degree of \$100 is better than a cost per degree of \$200. The scaled relative reciprocals of the two costs in this example, scaled to an index of 100 as the best result, are 100 and 50, respectively.

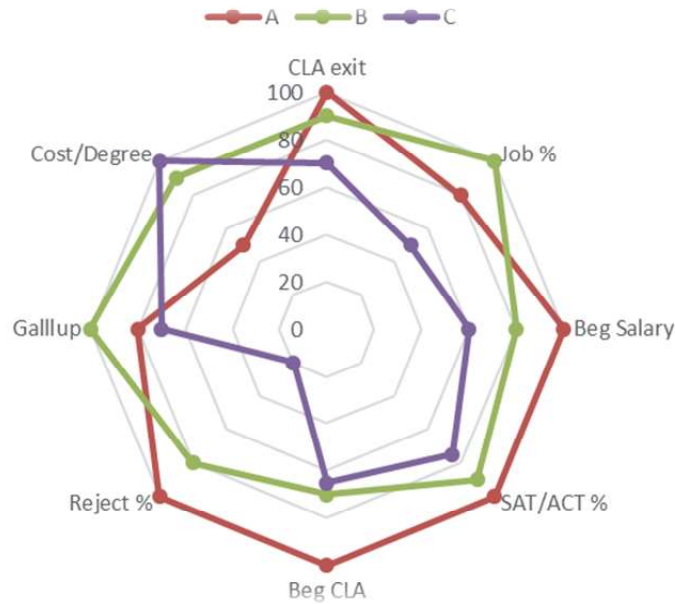
To illustrate the use of a radar chart assume the values listed in Table 1 for three different universities for all of the measures cited above. Note, the measures in Table 1 are already scaled and indexed to 100 as the best result. See Exhibit 2 with the values charted.

**TABLE 1
INDEXED DATA FOR EACH UNIVERSITY**

| University | CLA exit | Job % | Beg Salary | SAT/ACT % | Beg CLA | Reject % | Gallup | Cost/Deg |
|------------|----------|-------|------------|-----------|---------|----------|--------|----------|
| A | 100 | 80 | 100 | 100 | 100 | 100 | 80 | 50 |
| B | 90 | 100 | 80 | 90 | 70 | 80 | 100 | 90 |
| C | 70 | 50 | 60 | 75 | 65 | 20 | 70 | 100 |

The information in Exhibit 2 allows prospective students to better determine which university is best suited for them. For example, university A has the highest average starting salary, but university B has the highest job placement. Individual students, for whatever reason, may prefer a higher probability of achieving employment to a higher starting salary. Accordingly, those students may prefer University B.

**EXHIBIT 2
COST EFFECTIVE COMPARISON AT THE UNIVERSITY LEVEL**



University A has the profile of a university that is more prestigious. This is assumed because of the higher reject percentage of applicants, higher ACT/SAT scores and beginning CLA scores. It also has the highest cost per degree.

A taxpayer, or donor, may note the mid-range cost of University B and the high performance with respect to job placement. University B also has a higher rated organizational culture based on the Gallup poll. Additional insight for performance might be calculated using the same variables and rankings in Table 1 to calculate a composite index, so that all variables are captured into one performance index. Table 2 makes the calculation, assuming equal weights for all variables.

**TABLE 2
COMPOSITE INDEX WITH EQUAL WEIGHT**

| University | Composite Index |
|------------|-----------------|
| A | 88.75 |
| B | 87.5 |
| C | 63.75 |

This analysis illustrates that both University A and B are performing almost equally based on the composite index. Note that Table 3 illustrates the cost to obtain one additional point in the index so that cost is factored in. Under this measure of cost-effectiveness, University B is ranked first, illustrating a relatively larger “bang for the buck” compared to Universities A and C.

TABLE 3
DOLLAR COST PER INDEX POINT BY UNIVERSITY

| University | Dollar cost per index point |
|------------|-----------------------------|
| A | 0.047143 |
| B | 0.078436 |
| C | 0.058571 |

Further comparisons can be made by drilling down within each university. That is, intra-university comparisons can be made between colleges based on value. It is also possible to drill down further and make intra-university comparisons of departments within academic colleges.

See Table 4, which contains assumed data for four academic colleges within University B. Exhibit 3 graphs the data of the four colleges in a radar chart, as was done with the comparison of universities in Exhibit 2.

TABLE 4
INDEXED DATA AT THE COLLEGE LEVEL

| College | CLA exit | Job % | Beg Salary | SAT/ACT % | Beg CLA | Reject % | Gallup | Cost/Degree |
|---------|----------|-------|------------|-----------|---------|----------|--------|-------------|
| A | 100 | 90 | 70 | 100 | 95 | 80 | 80 | 100 |
| B | 90 | 100 | 100 | 95 | 100 | 100 | 100 | 95 |
| C | 60 | 65 | 60 | 85 | 85 | 50 | 70 | 80 |
| D | 50 | 40 | 30 | 75 | 80 | 70 | 75 | 90 |

The same approach described earlier with university comparisons can be used to determine rank and index scores. Exhibit 3 illustrates that Colleges A and B are consistently out-performing the other colleges in terms of value-based assessments.

**EXHIBIT 3
COST EFFECTIVE COMPARISON AT THE COLLEGE LEVEL**



Table 5 calculates the Composite Index from the variables in Table 4 for each academic college. College B appears to be the most cost effective based on the Composite Index, as well as the additional index point per dollar cost, which is shown in Table 6.

**TABLE 5
COMPOSITE INDEX FOR COLLEGES WITH EQUAL WEIGHT FOR ALL VARIABLES**

| College | Totals for all variables | Composite |
|---------|--------------------------|-----------|
| A | 715 | 89.375 |
| B | 780 | 97.5 |
| C | 555 | 69.375 |
| D | 510 | 63.75 |

**TABLE 6
DOLLAR COST PER INDEX POINT FOR EACH COLLEGE**

| College | Dollar cost per index point |
|---------|-----------------------------|
| A | 0.087857 |
| B | 0.092932 |
| C | 0.054286 |
| D | 0.054005 |

IMPLICATIONS AND CONCLUSIONS

Some of the metrics suggested in this paper for use in value-based assessment will require more discipline by Offices of Institutional Assessment in their data-gathering processes. Some institutions do not have reliable data on some of the suggested metrics, such as average salaries and employment rates. While it is often difficult to obtain reliable data, this is not a reason to not develop processes designed to obtain it. The benefits of additional costs to develop processes designed to provide more reliable data should easily pass the cost/benefit threshold.

Traditional financial reporting requirements of universities are focused on compliance which results in a paucity of information on university performance. Reporting value-based information is a manifestation of a desire to evaluate stewardship by university administrators and to introspect on paths to improvement. The university's seriousness concerning stewardship, self-evaluation and introspection reflected by value-based assessments can be used as a marketing strategy to stakeholders to differentiate the university's brand and image.

Secondly, value-based assessment is important for numerous stakeholders. Externally reporting the information assists taxpayers, legislators, regulators, donors, students and others in the various analyses each group performs. For example, legislators can make decisions about how and where to allocate scarce resources, based on expected value derived from resource consumption at individual universities. Students and parents can make individual decisions about alternative choices based on their individual perspectives concerning value as reflected in the individual university value assessment.

Reports prepared under a value-based methodology are succinct and easy to understand. Stakeholders do not need specialized knowledge or training to draw conclusions or make comparisons.

Third, internal management can be enhanced by spurring continuous improvement efforts as universities benchmark their value-based assessments. Benchmarked results can be used to identify best practices. For example, Exhibit 2 illustrates that University B does well on the Gallup Survey indicating a highly engaged faculty. At the same time, cost per degree is significantly better than University A. An analysis of management and leadership practices of University B and their cost structure could be instructive to determine the critical distinguishing factors and practices that other universities could employ in order to improve.

Value-based assessments enable administrators to focus on specific variables that can narrow their focus to those metrics that matter to each specific university given their unique mission and strategies. This allows for a more systematic management that enables an in-depth analysis to determine the drivers that influence those specific variables that impact value, which can reveal critical success factors and other important management information required for continuous improvement.

The analysis of the drivers of value as defined in the assessment, in conjunction with continuous improvement tools, will produce greater clarity concerning how resource consumption impacts outcomes and highlights potential paths to continuous improvement. Once continuous improvement initiatives are begun, subsequent value-based assessments can establish the efficacy of initiatives. In this way, an evidence-based model can be established that enables attribution of efficacy and efficiency.

Finally, legislatures can use value-based assessments to experiment with performance funding mechanisms to ensure taxpayers receive appropriate value for allocated state funds. Utilizing value-based results helps to filter out political noise and enables legislators to fulfill their obligations to taxpayers concerning resource allocations that are more likely to add greater value to society.

Despite rising costs and perceptions of declining quality, nothing of substance is changing in the higher education management or financial reporting model. Policy makers and administrators have a sacred responsibility to society to seriously search for solutions to the current crisis. A parsimonious portfolio of measures, such as is presented here, utilizing input, process and various outcomes metrics provides several dimensions of value that can be utilized internally to continuously improve and externally to provide stakeholders with insight into the value added by particular institutions.

REFERENCES

- Alach, Z. (2017). Performance measurement maturity in a national set of universities. *International Journal of Productivity and Performance Management*, 66(2), 216-230.
- Arum, R. & Roksa, J. (2011). *Academically adrift: Limited learning on college campuses*. Chicago, IL: University of Chicago Press.
- Association of American Colleges and Universities (2011). *The LEAP Vision for Learning: outcomes, Practices, Impact and Employers' View*. Washington, D. C.: Author.
- Bowen, H. R. (1980). *The Costs of Higher Education*. San Francisco, CA: Jossey-Bass.
- Callan, P. M. (2008). The 2008 national report card: Modest improvements, persistent disparities, eroding global competitiveness. *Measuring Up 2008*. www.highereducation.org.
- Campos, P. F. (2015). The real reason college tuition costs so much. *New York Times Opinion*. April 5, 2015: SR4.
- Casner-Lotto, J., & Barrington, L. (2006). *Are They Really Ready to Work? Employers' Perspectives on the Basic Knowledge and Applied Skills of New Entrants to the 21st Century US Workforce*. Partnership for 21st Century Skills. 1 Massachusetts Avenue NW Suite 700, Washington, DC 20001.
- Drengenberg, N & Bain, A. (2017). If all you have is a hammer, everything begins to look like a nail – how wicked is the problem of measuring productivity in higher education?. *Higher Education Research and Development*. Vol 36, No. 4. 660-673.
- Doost, R. K. (1998). Financial accountability: A missing link in university financial reporting systems. *Management Auditing Journal*. Vol 13:1. 57-74.
- Fischer, M. & Gordon, G. (2016). Public college and university financial statements; Reformat enables strategic cost management. *Cost Management*. November/December. 1-7.
- Glum, J. (2017). Is College Worth It? Many Students Still Lack Critical thinking Skills after Completing Higher Education. www.newsweek.com/college-value-critical-thinking-test-621671.
- Gordon, G. (2017). *Leading Through Trust: leveraging Performance and Spanning Cultural Boundaries*. Palgrave MacMillan.
- Gordon, G. (2016). Re-affirmation of the importance of the control environment for auditors of publicly-supported universities. *Internal Auditing*. March/April. 24-33.
- Gordon, G. & Fischer, M. (2011). Accounting strategy to improve public higher education management. *Journal of Accounting and Finance*. 11(3), 11-25.
- Gordon, G. & Fischer, M. (2014). "Public University Presidential Compensation: Performance, Cost Efficiency and Spending Choices." *Journal of Public Budgeting, Accounting and Financial Management*. Vol. 26, No.4, pp 557-584.
- Gordon, G. & Fischer, M. (2015). Strategic Planning in Public Higher Education: Management Tool or Publicity Platform? *Educational Planning*. Vol 22, No. 3 pp 5 - 17.
- Green, J., Kisida, B., & Mills. J. (2010). Administrative bloat at American universities: The real reason for high costs in higher education. *Policy Report No. 239*. The Goldwater Institute. August 17, 2010.
- Guskin, A. E. (1994). Restructuring the role of faculty. *Change*. October. 16-25.
- Hollands, F. M., Kieffer, M. J., Shand, R., Cheng, H and Levin H. M. (2016). Cost Effectiveness Analysis of early Reading Programs: A Demonstration with Recommendations for Future Research. *Journal of Research on Educational Effectiveness*. Vol. 9, No. 1. Pp. 30-53.
- Immerwahr, J. (2004). *Public Attitude on Higher Education A Trend Analysis 1993-2003*. New York, NY: Public Agenda.
- Kaplan, R. S., & Porter, M. E. (2011). How to solve the cost crisis in health care. *Harvard Business Review*, 89(9), 46-52.
- Langfitt, T. W. (1990). The cost of higher education: Lessons to learn from the health care industry. *Change: The Magazine of Higher Learning*. 22(6), 8-15.

- Levin, H. M. (1975). Cost-Effectiveness in Evaluating Research. In M. Guttentag and E. Struening (Eds.) *Handbook of Educational Research*.
- Levin, H. M. (1991). Raising productivity in higher education. *Journal of Higher Education*. 62(3), 241-262.
- Liu, O. L., Frankel, L. and Roohr, K. C. (2014), Assessing Critical Thinking in Higher Education: Current State and Directions for Next-Generation Assessment. ETS Research Reports Series, 2014: 1–23. doi:10.1002/ets2.12009
- Massy, W. F., Sullivan, T. A., & Mackie, C. (2013). Improving measurement of productivity in higher education. *Change: The magazine of higher learning*, 45(1), 15-23.
- McEwan, P. J. (2012). Cost-effectiveness analysis of education and health interventions in developing countries. *Journal of Development Effectiveness*, 4(2), 189-213. <http://www.payscale.com/about/press-releases/payscale-and-future-workplace-release-2016-workforce-skills-preparedness-report>
- Rahman, M. (2015). Approaches to Managing Costs in American Higher Education. *Journal of Knowledge Globalization*, 8(1), 1-33.
- State Higher Education Executive Officers Association (SHEEO) (2017). *State Higher Education Finance: FY 2016*. Boulder, CO: SHEEO.
- Symonds, W. (2003). Colleges in crisis. *Business Week*. No. 3830, April 28.
- Thaker, N. G. Ali, T. N., Porter, M. E., Feeley, T. W., Kaplan, R. S., and Frank, S. J. (2016). Communicating Value in Healthcare using Radar Charts: A Case Study of Prostate Cancer. *American Society of Clinical oncology*. Vol. 12, No. 9. Pp. 813-820.
- Tinker, A. (2017). The Top 7 Outcomes Measures and 3 Measurement essentials. *Health Catalyst*. Downloaded June 21, 2017 at: <https://www.healthcatalyst.com/The-Top-7-Outcome-Measures-and-3-Measurement-Essentials>
- Vedder, R. K. (2004). Going broke by degree: Why college costs too much. *American Enterprise Institute*.
- Vedder, R and Strehle, J. (2017). The Diminishing Returns of a College Degree. *The Wall Street Journal*. Vol. 269, No. 129 (June 5, 2017). P. A19.
- Zemsky, R. M. & Massey, W. (1990). Lost containment: Committing to a new economic reality. *Change*. Vol 22. Nov/Dec. 16-22.