

SUSTAINABLE EDUCATION IN THE AFTERMATH OF THE COVID-19 PANDEMIC: IMPLICATION OF LEAN MANAGEMENT AND CONTINUOUS IMPROVEMENT STRATEGIES

I. Introduction

The public, regulators, business organizations, and the academic community are taking a closer look at colleges and universities to find ways to hold these institutions more accountable for achieving their mission of providing higher education with affordable and relevant curriculum while preparing students for leadership roles in the technology-driven and competitive marketplace. A 2012 study of 1,700 public and private institutions of higher education suggests that about one-third of colleges and universities have been on an unsustainable financial path and another 28 percent are at the risk of becoming unsustainable¹. Tuition at public universities and colleges has significantly increased in the past decade (about 9% in 2012) as state governments have slashed university funding. Recent higher education is being perceived as costing too much and achieving too little. In recent years and prior to the 2020 COVID-19 pandemic, financial positions of many colleges and universities have been strong because of higher enrollment and generous endowments but conditions have changed for many of these institutions.² Colleges and Universities in the United States are anticipating a significant loss of revenues resulting from the pandemic. For example, the University of Michigan anticipate a loss of up to \$1 billion whereas Harvard University is expecting a \$750 million revenue shortfall in 2020.³ The revenue shortfall for the University of Memphis for 2020 is estimated \$17 million. Recently, the University of Memphis has been ranked among the world's top universities and is only one of only three honored in such a high ranking in the State of Tennessee (in addition to Vanderbilt and The University of Tennessee) according to the 2021

Times Higher Education World University Rankings.⁴ The University of Memphis is in the process of obtaining a Carnegie level one research institution and its education sustainability of offering affordable and high-quality education as well as relevant and impactful research and service is essential in this process. Figure 1 presents a model of education sustainability.

The 2020 COVID-19 pandemic has significantly altered business as usual for colleges and universities from primarily in-class learning to mostly virtual learning of delivering the most efficient and effective ways to meet the imposed financial challenges and restructuring of operations to ensure continuity and sustainability. Nonetheless, long-term sustainability of colleges and universities is vital to the economic growth and prosperity of our nation in preparing the next generation of human capital. The short-term financial effects of the pandemic on The University of Memphis include cash flow deficiencies resulted from losing dining revenues, parking fees, refunding of tuitions, room and boarding fees, and long-term uncertainty relevant to the centuriation of delivering affordability and sustainability of education. The university has addressed the short-term budget effects of the pandemic by appointing a Budget Reduction Taskforce on July 7, 2020. The Budget Taskforce has made several recommendations/strategies to address the immediate shortfall of \$17M, known as Phase I.

The long-term effects of the pandemic and sustainability of education at the University of Memphis are addressed by the Working Group of the Standing Advisory Budget and Finance Committee of the Faculty Senate (WGBFS), which was established on September 1, 2020. The WGBFS is charged to examine the sustainable and affordable education at the University of Memphis in the aftermath of the COVID-19 pandemic by reviewing the educational activities of Academic Affairs Units. The review of all Academic Affairs Units will be conducted buy using lean management and continuous improvement strategies presented in Figures 1-3, based on the

financial and non-financial metrics outlined in Appendix B and strengths, weaknesses, opportunities, threats, safeguards/sustainability (SWOTS) analysis described in Appendix A.

II. Institutional Background

The social distancing feature of the COVID-19 pandemic demands universities and colleges worldwide to transform their programs and courses to virtual and online classes in the foreseeable future. The COVID-19 pandemic has also caused many financial challenges for universities and colleges because of potential decreases in students' enrollment and government financial supports. The CARES Act provides some financial assistance by allocating \$32 billion to support all levels of education and \$7 billion for student aid. Each university and college should establish a steering committee to address education challenges of the COVID-19 pandemic and design strategic plans for possible return to campus in the Fall of 2020 and onwards. The University of Memphis (UoM) has considered guidelines provided at local, state, and federal levels to ensure a safe environment for students, staff, and faculty, maintain the education quality, and secure sustainability and financial health of the university.

Sustainable education starts in the classroom where we train future generations of workforces and leaders to better understand community and market demands for higher education. The main objective of the UoM is to provide educational services to the community in creating, disseminating, and implementing knowledge. The main goal is to transform the University from Carnegie level 2 to level 1 in terms of research, academic and non-academic programs, serve the diverse students, and tailor our education programs toward the needs of students, neighborhood, or district betterment involvement.

At the University of Memphis, the administrators and the entire management team are facing significant challenges brought on by the COVID-19 pandemic. Among these challenges are protecting the students and the employees in terms of safety and health, changing the work environment to enable remote working, performing human capital risk assessment, dealing with supply chain disruption, and modifying the financial budget to provide adequate cash and liquidity. These challenges provide opportunities for universities to maintain continuity, sustainability and efficient transformation of their education, business, financial, and operational functions. The University of Memphis has responded to the challenges brought on by the COVID-19 pandemic by appointing a Budget Reduction Taskforce on July 7, 2020. The Budget Taskforce has made several recommendations/strategies for the following two phases:

1. Phase I - Recommendations/strategies to address the immediate known shortfall of \$17M.
2. Phase II - Recommendations/strategies to address any additional budget shortfalls because of a drop in enrollments and/or additional financial impacts given the ongoing difficulties related to the COVID-19 pandemic.

The effective implementation of these two phases require a comprehensive and coordinated approach by the central administration and all colleges, schools, and departments in consultation with the faculty senate in assessing and managing their activities. The lean management and continuous improvement strategies (LMCIS) provide a blueprint for and effective and guided execution of this complex task. The following sections provide insight into the basic features of the LMCIS and how they are applicable to institutions of higher learning as they make necessary adjustments in response to the unusually difficult circumstances brought on by the COVID-19 pandemic.

III. Lean Management

The concept of lean management is very relevant in the post-COVID-19 era and applicable to the charge of the WGBFS in addressing education sustainability at the University of Memphis. There are three guiding principles of the lean management as related to the charge of the WGBFS: (1) promoting the main objective of delivering high quality, sustainable and affordable education by focusing on cost-effective and efficient teaching, research, and service; (2) implementing continuous improvement of identifying strengths and concerns and finding ways to consciously improving the education process; and (3) eliminate waste and duplication by optimizing the use of resources and restructuring, reengineering, and integrating activities. The lean management concept promotes the link between cost management (cost centers) and performance management (revenue centers) as they are affected by managerial strategy in response to the COVID-19 challenges. The lean management is a process of examining efficiency, effectiveness, and program results to offer high-quality and affordable and sustainable educational programs. Two managerial concepts of cost management relevant to the cost centers and performance management relevant to revenue centers are interdependent and should be integrated in achieving lean management and operational objectives and effectiveness. Cost management addresses the budget cuts of phase I in the context of lean management, whereas performance management focuses on continuous improvement in achieving sustainable high-quality education and generating revenues.

IV. Continuous Improvement

Continuous improvement strategies involve classifying university activities into four categories: value-adding, non-value adding, essential, and nonessential, and have traditionally been used by business organizations.⁵ The focus on continuous improvement has become more

crucial in the aftermath of the COVID-19 pandemic. The university and its finance function and the CFO in consultation with the Faculty Senate are in a necessary position to work with administration and colleges, schools, and departments in assessing what activities to restructure, what activities to prioritize, and what activities to emphasize. In the post-COVID-19 environment with advanced technological innovation, continuous improvement becomes crucial in gaining a competitive advantage and maintaining sustainability. Continuous improvement can enable the university to cope with challenges brought on by the COVID-19 pandemic and effectively implement recommendations of the Budget Taskforce. University activities and particularly activities of each Academic Affairs unit can be classified into four categories as depicted in Figure 2:

A. Highest Value-Adding and Essential- These activities add value to the university's main purpose and mission of offering high-quality, affordable, and sustainable education and are essential in maintaining the continuity and sustainability of the university. These activities such as teaching, and research are adding value and any disruption can have detrimental effects on sustainability. Examples of these activities are productive undergraduate, graduate, and PhD programs with effective teaching, productive research, and meaningful services. All academic programs that are cost-effective and efficient are considered value-adding and essential.

B. High Value-Adding but Less-Essential

These are activities that are considered as value-adding but may be minimized without losing the value-added feature through re-engineering and restructuring. Colleges, schools, and departments should consider optimizing these activities in the post-COVID-

19 pandemic and in the light of the current budget cuts. Example of these activities are excessive administrative and staff activities and related compensation.

C. Lowest Value-Adding but Essential

These are activities that do not add value but are essential. Example of these activities are administrative and staff activities including physical plant. However, activities such as middle-level managerial positions (e.g., associate deans, directors, unnecessary staff) should be minimized, especially in the post-COVID-19 era.

D. Lowest Value-Adding and Less-Essential

These are activities typically excluding academic programs that neither add value nor considered essential and thus must be restructured, consolidated, or eliminated in the post-COVID-19 era to ensure continuity and sustainability. Example of these activities are unnecessary administrative, staff, and instructor positions. At the present time the WGBFS is unaware of any University of Memphis programs that should be judged to be, “Non-Value-Adding and Non-Essential”.

V. Plan of Action

Colleges and universities have developed a multi-phase plan for reopening their campus with different timeframes for implementing these phases with the final phase aiming at allowing students, staff, and faculty return to campus eventually. Some classes can continue to be online and conducted virtually with remote learning. The business recovery, sustainability, and transformation are essential strategic planning for coping with growing challenges caused by the COVID-19 pandemic. The central administration in collaboration with colleges and faculty senate should consider all possibilities and scenarios under which the university can survive, recover, and continue sustainable performance in offering high-quality education.

On September 1, 2020, Provost Nenon requested the Budget and Finance Committee (BFC) to conduct Lean Management and Continuous Improvement reviews on the Academic Affairs units. The BFC has formed the WGBFS consisting of:

Alena Allen (BFC Member, Law School)

Tom Banning (Past President of Senate, Engineering)

Greg Barnes (KPMG Office Managing Partner, Alumni)

Ken Lambert (Past President of Senate, School of Accounting)

Holly Lau (BFC Member, Theatre & Dance)

Fawaz Mzayek (BFC Member, Epidemiology)

James Orr (ex-Officio, Assistant Vice Provost)

Darryl Poole (Bentley University Trustee Emeritus, Advisory: MIT/Sloan School)

Zabihollah (Zabi) Rezaee (Chair, School of Accountancy)

The WGBFS is tasked with:

- Reviewing and evaluating efficiency of administrative faculty and staff support in each unit.
- Reviewing and evaluating academic programs and identifying low producing programs that may be unsustainable and need restructuring, downsizing, or consolidation.

The WGBFS will start the review process in September 2020, to meet with all administrators of the Academic Affairs units in Fall 2020, prepare its preliminary review report in January and February 2021, discuss its review reports and related recommendations with each unit administrators in March 2021, present the final review reports to the BFC for approval, present review report to the Faculty Senate for the final Approval, and finally forward review reports to the Provost for consideration in April 2021.

We will meet with the central administration, colleges, schools, departments, and other units to discuss the relevance of LMCIS in ensuring continuity and sustainability of our education programs. We view the University and each of the Academic Affairs unit as a community of faculty, students, administrators, and staff who are gathered to support learning by creating knowledge, disseminating knowledge, and implementing knowledge. This can be done through:

1. Shared governance
2. Respect for others.
3. Diversity and inclusion.
4. Integrity and honesty and competency in our academic, personal, and professional affairs.
5. Shared value creation.
6. A culture of accountability and transparency.

We will work with each Academic Affairs unit in preparing the assessment of strengths, weaknesses, opportunities, threats, safeguards/sustainability (SWOTS) analysis as detailed in Appendix A. Please do not hesitate to reach out to the WGBFS for assistance, consultation, and recommendation. The timeline of the WGBFS' activities is as follows:

1. The first week of September 2020: Dr. Rezaee was given the greenlight by the Provost to initiate the reviews. He formed the WGBFS and prepared the initial plan of action.
2. The second week of September 2020, a few members of the WGBFS reviewed and finalized the plan of action. Dr. Rezaee also invited the members of the WGBFS to join and got their commitment.

3. The third week of September 2020, Dr. Rezaee will submit the plan of action to the Budget and Finance Committee for approval and then to the WGBFS for the final approval and a Zoom meeting to initiate the reviews.
4. The fourth week of September 2020, a Zoom meeting with Deans of all Academic Affairs Units to initiate the reviews.
5. October, November, and December 2020, the WGBFS will visit and work with all Academic Affairs Units in the preparation of their review reports.
6. January and February 2021 will review submitted reports by all Academic Affairs Units and prepare its reports including recommendations.
7. March 2021, the WGBFS will meet with Deans to discuss recommendations and remedial actions.
8. April 2021, the WGBFS will prepare its final report, get it approved by the Budget and Finance Committee, present to the Faculty Senate for acceptance and submit to the Provost for consideration.

Figure I
Education Sustainability Model

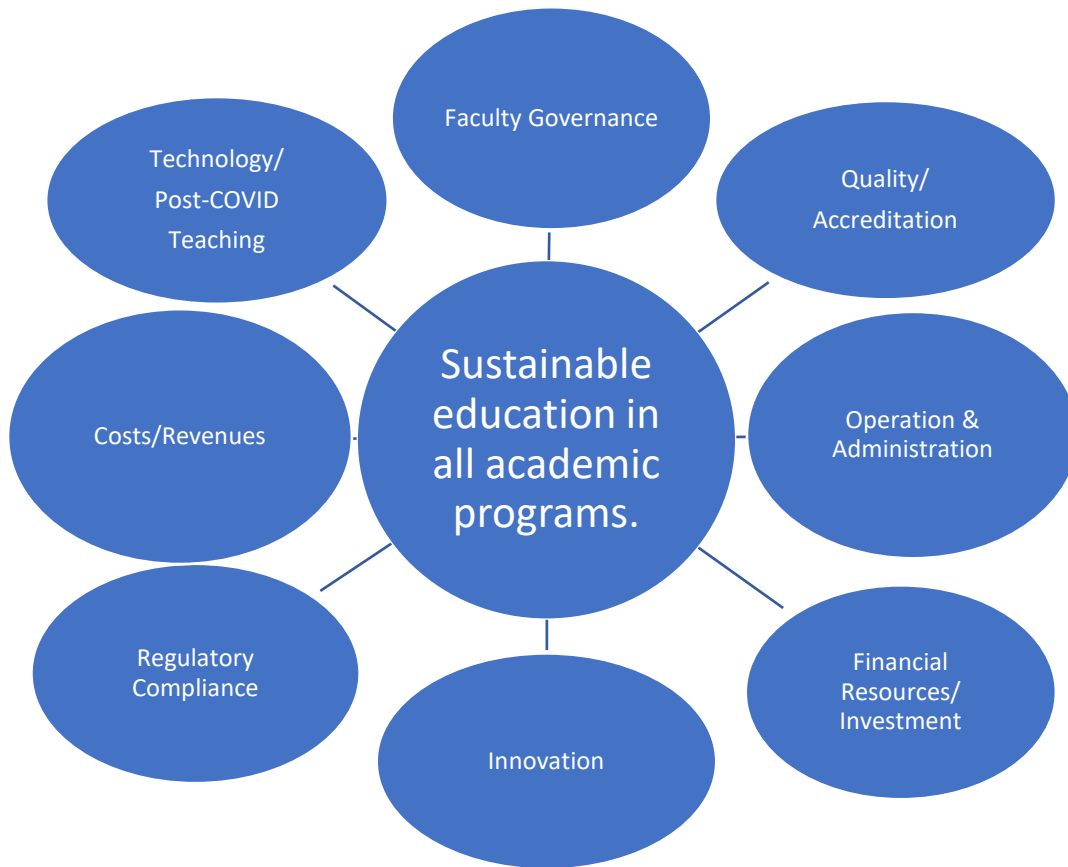
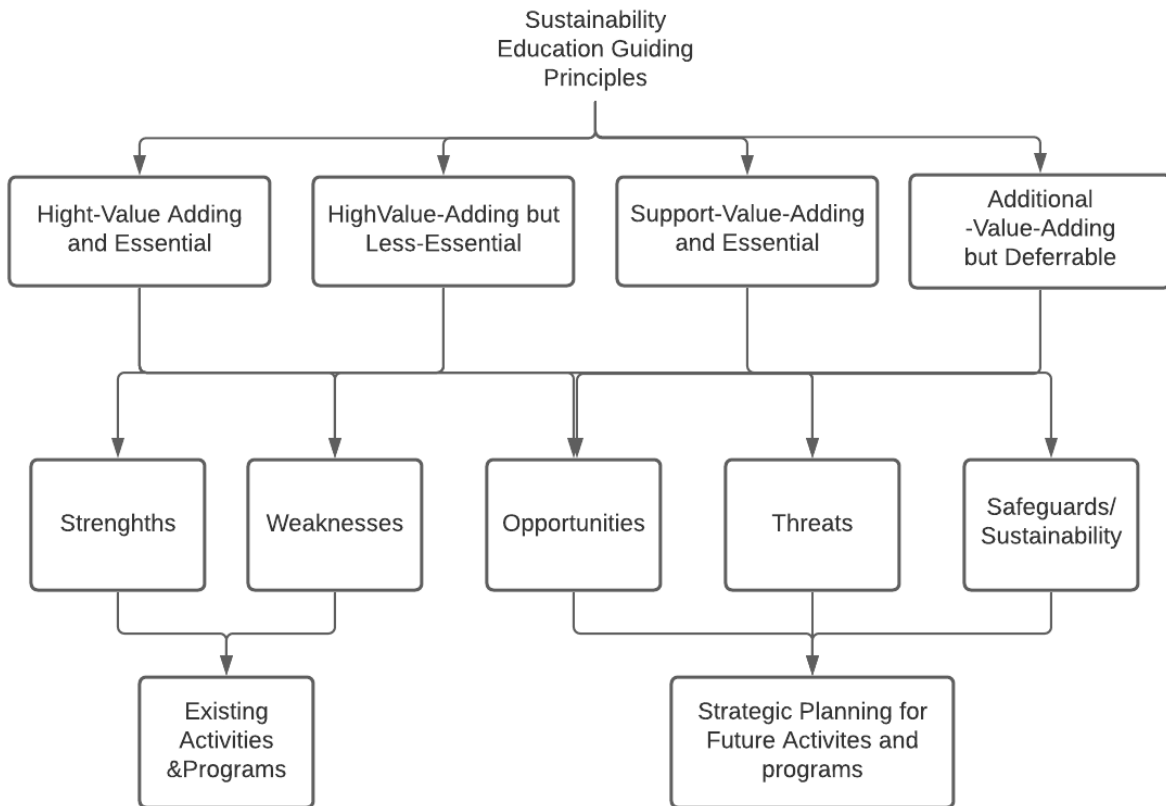


Figure 2
Continuous Improvement Model in the Aftermath of the COVID-19 Pandemic

	Highest Value-Adding Activities	Lowest Value-Adding Activities
Most Essential Activities	Strategic Focus A Enhance	Managerial Focus C Re-Prioritize
Least Essential Activities	Technical Focus B Prioritize	Cost saving Focus D Minimize and Justify

Figure 3



Appendix A

Strengths, Weaknesses, Opportunities, Threats, Safeguards/Sustainability (SWOTS) Analysis

A. Objective and Goals

The main objective is to provide educational services to the University Community in creating, disseminating, and implementing knowledge. The attainable goals are to:

1. Transform the University from Carnegie level 2 to level 1 in terms of research, academic, and non-academic programs.
2. Serve the diverse students and tailor our education programs toward the needs of students and the local communities.
3. Engage local communities and promote participatory research based on valid community needs assessments.
4. Continuously support and expand high-quality research and enhance knowledge dissemination and sharing on the local, state, national, global levels.
5. Create an ethical, healthy, safe, educational, and fun campus environment.
6. Promote high quality and quantity academic and non-academic programs.
7. Promote transparency and accountability: At the University, transparency is providing insight into how money is generated and how it is spent, and decisions are made in improving the quality of educational services, innovation, growth, efficiency, and effectiveness.
8. Support student success and wellbeing.
9. Create College-town feeling on and around our campus by investing in the neighborhood betterment projects.

B. Opportunities

Opportunities provided by LMCIS in achieving high quality, affordable, and cost-effective academic programs and thus, sustainable education are:

1. Classifying activities to the four categories of value-adding, non-value-adding, essential, and non-essential.
2. Implementing the lean management concept.
3. Promoting accountability at the university level and within all colleges and academic programs.
4. Achieving sustainable, affordable, and cost-effective college education.
5. Encouraging colleges and academic units and programs to plan to provide sustainable education in light of potential budget cuts and in the aftermath of the COVID-19 pandemic.

6. Encouraging shared-governance and faculty participation in curriculum design and development.
7. Enabling linking strategic planning to the mission through the strategic resource investment initiative (SRI) model.
8. Identifying strengths and concerns of each academic program, college, and university overall.
9. Promoting risk assessment and management.
10. Creating a system of checks and balances.
11. Discovering ineffectiveness and inefficiencies.
12. Identifying sustainable and productive colleges and academic programs as well as unsustainable and challenging colleges and academic programs.
13. Creating incentives for faculty to improve their research productivity, teaching effectiveness, and service commitments.
14. Creating value for all university constituencies (administrators, faculty, students, staff, alumni, government, and the community).

C. Challenges and Threats

Challenges and threats relevant to the implementation of LMCIS are as follows:

1. It should be linked to the university/college strategic planning.
2. It should be based on flexible planning and budgeting rather than static planning.
3. It should be based on the concept of lean management by identifying multiple revenue drivers and cost drivers and their strengths and weaknesses.
4. It should encourage collaborations and interdisciplinary programs among colleges/academic programs rather than creating competition among colleges and programs.
5. It should not allow colleges to use it as a way of highlighting deficits to reduce their burden of franchise fee demanded by central administration.
6. It should be linked to both quantitative and qualitative factors and drivers based on balance scorecards of achieving both quality and quantity of programs.
7. It should recognize that the LMCIS are not perfect and mistakes may occur in forecasting and judgments may require modifications.
8. It should emphasize the importance of the LMCIS as a planning device.
9. It should encourage wide participation in LMCIS development and preparation at all levels by faculty and administrators.
10. It should demonstrate the LMCIS have the complete support of administrators and faculty, especially the central administration.
11. It should identify both poor and good performance, reward good performance, and minimize bad performance.

D. Strengths/weaknesses

1. Enhancing quality and quantity of enrolled students.
2. Provide security, health, and safety for students, staff, and faculty.
3. Ensure cybersecurity.
4. Deliver and monitor the integrity of online courses.
5. Use smart classroom with High-Tec equipment.
6. Promote shared governance in all colleges.
7. Prioritization of expenditures.
8. Create a right balance between short term and long-term needs.
9. Focus on longer-term demographics.
10. Address the competitive marketplace in higher education.
11. Invest in capital programs and their impact on current program delivery.
12. Transparency and accountability: lack of hidden agendas and conditions, availability of full, accurate, and complete information. Transparency is not as simple as disclosing and sharing the last budget or sharing minutes of the last meeting about key performance indicators and how accurately they are being disclosed.
13. Focus on Strategic Resource Investment (SRI) initiative to develop a better more responsive, transparent, and flexible way to provide information useful in making resource allocation decision.
14. Address challenges an increasingly complex population which includes 'traditional' students, non-traditional students, students re-entering the workplace, students transitioning from Military service, urban-based students, rural-based students, unprepared student populations, on-line and technology-oriented students, and senior/continuing education students

Appendix B

Financial and Non-Financial Key Performance Indicators

Challenges imposed by the COVID-19 pandemic demand colleges and universities to present reliable, relevant, transparent, and useful financial and nonfinancial information on their key performance indicators (KPIs) pertaining to their educational sustainability. Key performance indicators (KPIs) are often quantifiable measurements that reflect the critical success factors of colleges and universities and help them define and measure progress toward achieving goals.

1. Financial/Quantitative Key Performance Indicators

- Admin/Staff expenditures
- Asset performance
- Operating results
- Reserve ratio
- Capitalization ratio
- Leverage ratio
- Physical assets ratio
- Age of facilities ratio
- Facilities maintenance ratio
- Deferred maintenance ratio
- Cash income ratio
- Return on net assets
- Net Operating Revenues
- Total expenses
- Net tuition
- Return on Endowment
- Endowment Pool
- Endowment Scholarship
- Endowment Assets Per full-time equipment students (FTE)
- Primary Reserve Ratio
- Core Operating Margin (surplus)
- Tuition as A Percentage of Core Revs
- Percent Freshman Getting Institutional Grants.
- Instruction Expenses Per FTE

2. Non-Financial/Qualitative Key Performance Indicators

- Student admission
- Student retention
- Student success/graduation
- Students' valuation of the program
- Research productivity
- Diversity and inclusion
- Adjustment to challenges imposed by the COVID-19 Pandemic
- Community engagement
- Honors program
- Promoting a culture of competency, integrity, and accountability
- Advancing reputation, trust, and good image
- Visibility and reputation (state, national and international rankings, awards)

Endnotes

¹ Blumenstyk, G. 2012. One-Third of Colleges Are on Financially ‘Unsustainable ‘Path, Bain Study Finds. The Chronicle of Higher Education (July 23). Available at http://chronicle.com/article/One-Third-of-Colleges-Are-on/133095/?cid=at&utm_source=at&utm_medium=en#top

² Deloitte. 2020. COVID-19 impact on higher education. Available at <https://www2.deloitte.com/us/en/pages/public-sector/articles/covid-19-impact-on-higher-education.html>

³ World Economic Forum (WEF). 2020. An economist explains how COVID-19 will impact universities. July 16, 2020. Available at <https://www.weforum.org/agenda/2020/07/will-universities-learn-from-lockdowns/>.

⁴ Times Higher Education. 2020. The World University Ranking. Available at <https://www.timeshighereducation.com/world-university-rankings>

⁵ Rezaee, Z, Agrawal, S and H. Pak. 2006. Continuous improvement: An activity-based model. *Management Accounting Quarterly* (Spring), 14–22.