LEAN HIGHER EDUCATION

Presentation to Kentucky Community & Technical College System ProcessPalooza

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The Need for Change in HE

Funding challenges: Financial support for higher education (HE) has eroded and shows no sign of returning to previous levels of support

Accountability to our "beneficiaries:" Labor intensive sector relying on a "cost-plus" business model; Increasing student loan burden impacts career choices and standard of living

Accountability to our "sponsors:" Perception of HE as inefficient and expensive has led to external pressures to contain costs; Greater public accountability of HE is demanded

Competitive advantage in an increasingly competitive marketplace: commoditization of HE; Technological advances in the design and delivery of HE

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Traditional Responses

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Traditional Reactive Responses	Stay the course: Challenges are transitory
	Cross your fingers: Continue to operate on "cost-plus" basis
Traditional Proactive Responses	Get through today: Plans of action for the near future (e.g., early retirement incentive, sweep budgets)
	Plan your way out: Bold plan (new mission, university-wide initiatives, strategic plan, culture shift) driven by leadership

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A (Not So) New Alternative: Lean Higher Education (LHE)
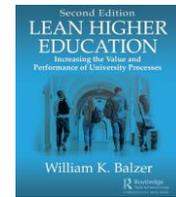
A WORKING DEFINITION: LHE is a problem-solving framework used to increase the value and performance of university processes. Grounded in the principles of continuous improvement and respect for people, the successful application of LHE will meet the expectations of those served by the processes, engage and develop the employees who deliver the processes, and enhance the efficiency and effectiveness of the university.

Balzer (2020)

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Examples of HE Processes (i.e., Services, Sets of Activities)

|			
Admitting students	Hiring faculty & staff	Moving students into residence halls	Purchasing supplies or services
Adding or dropping a course	Establishing partnership with an intl institution to support education abroad	Remodeling laboratory space for faculty research	Reserving a classroom
Student mental health assessment and therapy services	Offering a new course or major	Approving a grant submission	Advising students
Preparing mandated reports for governmental agencies	Reimbursing professional travel	Processing gifts from donors	Scheduling instructors for summer courses

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Lean Evolution: Beyond Manufacturing
NAICS 2017 Sectors (Balzer et al. 2019)

- **Agriculture**
- **Mining, Quarrying, and Oil and Gas Extraction**
- **Utilities**
- **Construction**
- **Manufacturing**
- **Wholesale Trade**
- **Retail Trade**
- **Transportation and Warehousing**
- **Information**
- **Finance and Insurance**
- **Professional, Scientific, and Technical Services**

- **Management of Companies and Enterprises**
- **Administrative and Support and waste management and Remediation Services**
- **Educational Services**
- **Health Care and Social Assistance**
- **Arts, Entertainment, and Recreation**
- **Accommodation and Food Services**
- **Other Services** (except Public Administration)
- **Public Administration**
- **Real Estate Rental and Leasing**

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Learning to See: Waste

Customer calls/ complaints/ loss
Waiting
Mistakes (and corrections)
Stress & dissatisfaction

Transportation
Incorrect inventory
Wasted motion
Overproduction
Defects & errors
Over processing
Wasted human potential
Slow machines
Duplicated effort
Waste & storage
Paperwork
Approvals
Overburdening employees
Unevenness
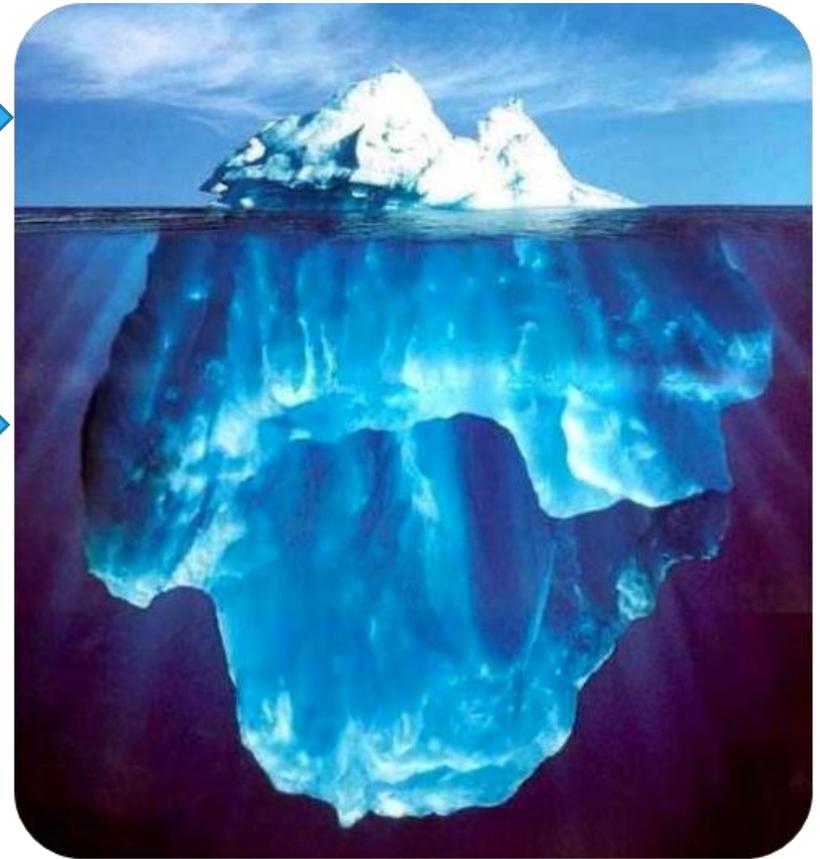
Why Lean Higher Education?

- Embraces institutional excellence through a **comprehensive approach** to operational (and strategic) excellence

- Offers a **practical framework and tools** (supported by research) to support relentless continuous improvement

- Favors **implementing solutions quickly**

- **Meets the expectations** of internal and external beneficiaries

- Values, engages, & develops the **full potential of all employees**

- **Frees up resources** for savings and/or reinvestment

- **Win-win-win** for beneficiaries, employees, and HE institution

- Transforms the institution into a **true learning organization**

Lean HE Institutions Around the World

- **Blue Mountain Community College (OR)**
- **Des Moines Area Community College (IA)**
- **Everett Community College (WA)**
- **Ivy Tech Community College (IN)**
- **Mt Hood Community College (OR)**
- **New Brunswick Community College (Canada)**
- **Northwood Technical College (WI)**
- **West Shore Community College (MI)**
- Bowling Green State University
- Miami University
- Michigan Technological University
- University of Central Oklahoma
- University of Michigan
- University of Iowa
- University of North Alabama
- University of Texas
- University of Washington
- University of Wisconsin
- Western Governors University
- Carleton University (Canada)
- Edinburgh Napier University (Scotland)
- Macquarie University (Australia)
- UiT the Arctic University of Norway
- University of Sheffield (Great Britain)
- University of St Andrews (Scotland)
- University of Strathclyde (Scotland)
- University of Waterloo (Canada)

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LHE Improving Many HE Processes

- **Benefiting students**: External admission inquiries; Ugrad/grad/postgrad/intl student admissions; Student move-in; Advising; Course registration; Billing; Academic success for at-risk students; ADA requests; Graduate student contracting; Student health services

- **Benefiting employees**: Fund transfer to international sites; Campus lost and found; Campus printing; Purchase orders; IT project requests; Donor gift recognition; Updating recruitment materials; Library reshelving; Final exam scheduling; ADA requests

- **Benefiting faculty/T&L:** Teaching improvements; Annual faculty activity reporting; Grant and contract accounting; Research project account setup; Program-wide academic course review; Grade change administrative process; Curriculum change approval

- **Benefiting facilities**: Bidding for large contracts; Summer programs/housing; Carpet cleaning; Building design/construction; Change orders; Reducing utility costs; Key approval/distribution

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The Breadth of LHE Applications for Improving HE Institutions & Systems

- Rapid Improvement Event (Kaizen)

- Lean Structured Problem Solving

- 5S Workplace Organization
  - Sort, Set in Order, Shine, Standardize, Sustain

- Lean in Daily Work: Lean Stand Ups/Huddles, 3C (Concern, Cause, Countermeasure), "Just Do It"

- Lean Meetings

- 3P (Production, Preparation, Process)

- Strategic Planning/Deployment (Hoshin Kanri)

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Supported by Lean Tools & Practices

Prioritization matrix	SIPOC/BOSCARD scoping chart	Team/project charter
1-page template	"Go and see" walk the process	Voice of customer
Kano analysis	Benchmarking	Benefits exploration map
CTQ requirement	Data collection plan	Run chart
Pareto chart	Five whys	Process mapping
Cross-functional flowchart	Spaghetti diagrams	Waste identification
Cause-and-effect diagram	Pain points	Gap analysis
Interrelationship diagraph	Brainstorming/Brainwriting	Affinity diagram
Multi-voting	Ease/benefit matrix	Solution selection matrix
Takt time	Trystorming	Error proofing
Action register/plan	Gantt chart	Responsibility matrix
Measurable benefits data plan	30/60/90 plan	Countermeasures
Force field analysis	RACI responsibility assignment matrix	

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The Rapid Improvement Event (Kaizen): The Best Known Application of LHE

1. Determine **who are the beneficiaries** (internal and external clients) and what they value from the college/university process

2. Analyze the current process from perspectives of both college/university & beneficiaries to identify steps that add or don't add value

3. Propose a new process using LHE to (a) **eliminate waste** and (b) **improve flow** - with <u>no</u> new resources assumed

4. Implement the new process and evaluate performance against established metrics

5. Achieve perfection through **continuous improvement** & radical transformation of process (& <u>maybe</u> resources later)

Case Studies of LHE: Project Examples

(Balzer 2010; 2020)

Benefiting Students: BGSU Counseling Center

Benefiting Employees: U Iowa Faculty & Staff Hiring Process

Benefiting Faculty/T&L: U Strathclyde Curriculum Changes

Benefiting Facilities: U Central Oklahoma Work Order Process

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BGSU Counseling Center Project
## Problem: Long wait for student counseling services

Step: Scope the Process

- Team established

- Student clients specify value

- "Walk" through the process from client & provider perspectives ("learning to see")

- KPIs collected

  - e.g., time from contact to counselor assignment

- Establish baseline performance of current process

Step: Analyze the current process

Current State Process Map:
Mental Health Assessment & Therapy Services
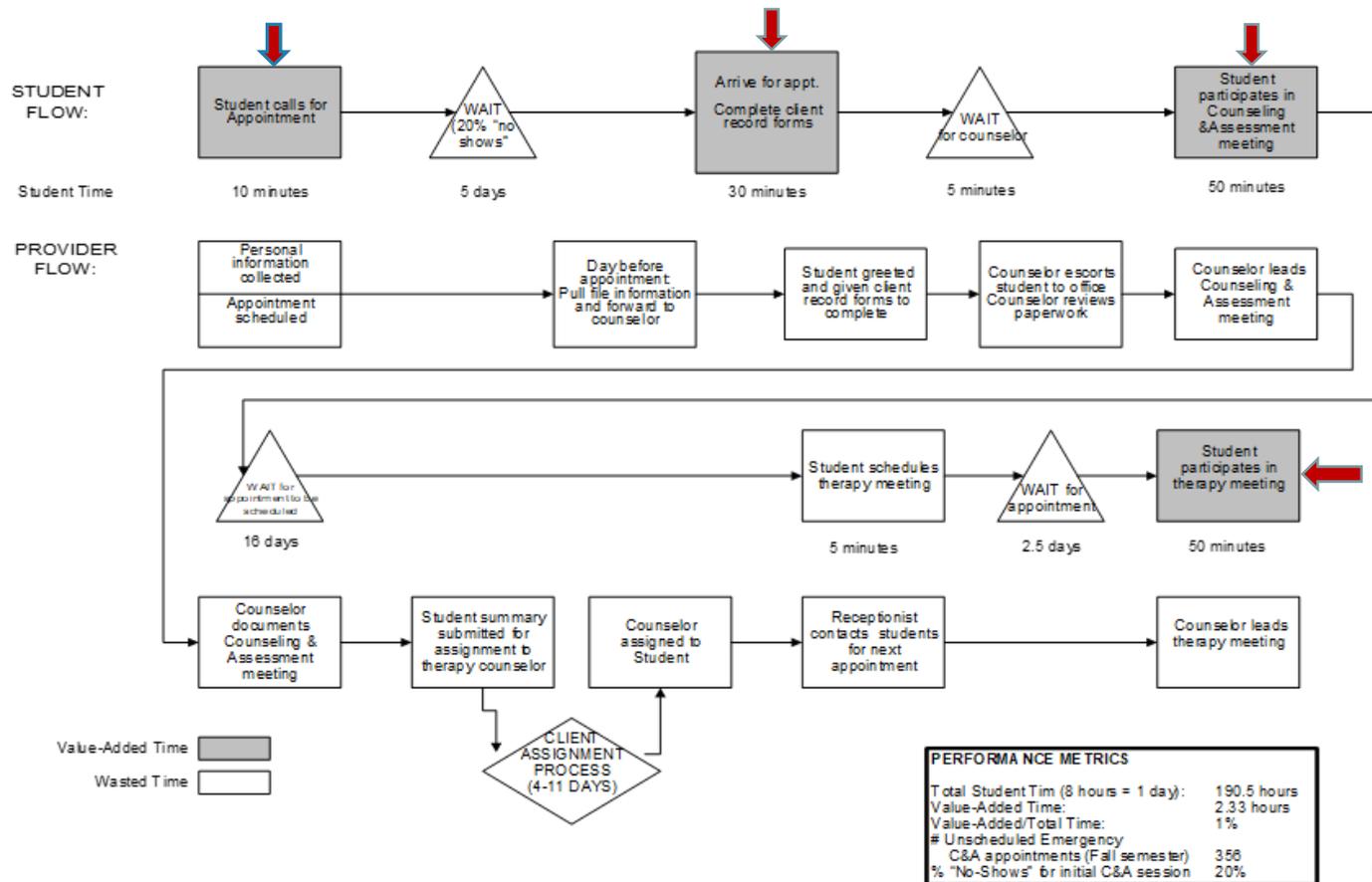
Step: Analyze the current process

Examples of Summary Statistics for the Current Consultation & Assessment Interview

Process Step	Average Time	Minimum Time	Maximum Time	Average Variation (Standard Deviation)
Time from Scheduling to Actual Appointment	4.9 Days	1.0 Days	9.0 days	2.2 Days
Student Arrival Time for Appointment	7.3 Minutes Early	10 Minutes Late	22 Minutes Early	9.4 Minutes
Time for Student to Complete Medical Forms	14.5 Minutes	2.0 Minutes	20.0 Minutes	4.6 Minutes
Student Waiting Time for Counselor	3.6 Minutes	1.0 Minute	7.0 Minutes	2.0 Minutes
Length of C&A Interview Session	50.5 Minutes	28.0 Minutes	93.0 Minutes	17.4 Minutes

Process *Note: Data presented are limited to the earliest steps of the C&AI process.*

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Step: Remove waste and improve flow

- Examine all process steps for value (vs. non-value waste) and contribution to flow

  - Waste of waiting for appointment

  - Waste of "no show" appointment times

  - Waste of gleaning information from forms

  - Waste of weekly "all inclusive" group meetings

  - Emergency services interrupting flow

  - Lack of flow moving student files within counseling center

Total Time: 12 - 21+ days

Value Added Time: < 2 hours

(**99% waste!**)

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Step: Remove waste and improve flow
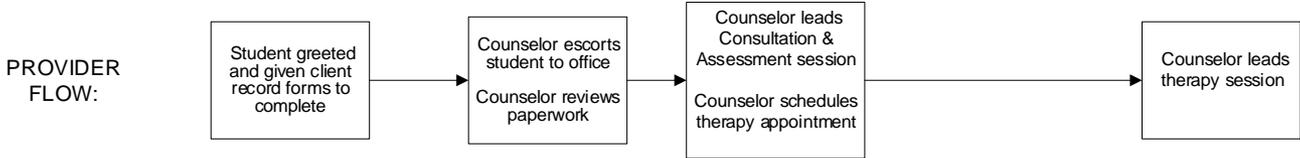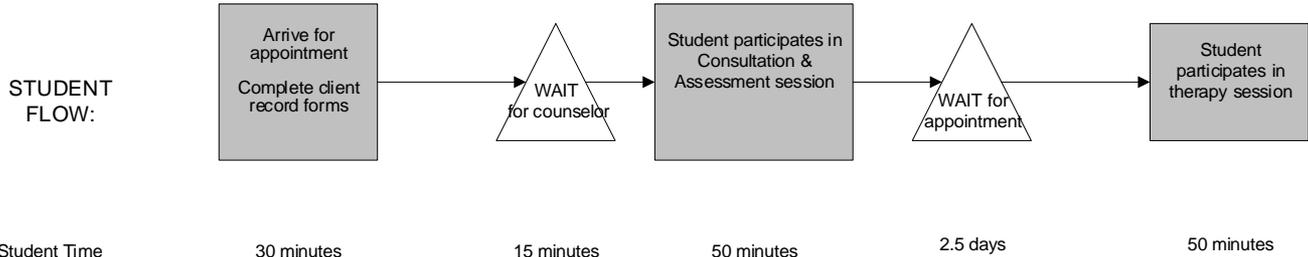
Propose & implement solutions

- <u>41</u> solutions proposed; many implemented:

  - **Implement "walk in" services for C&A interview**

  - Eliminate client assignment process meeting

  - Reschedule available counselor times

  - Streamline/reorganize client information forms

  - Standardize work (greater consistency in counselor's role in the process)

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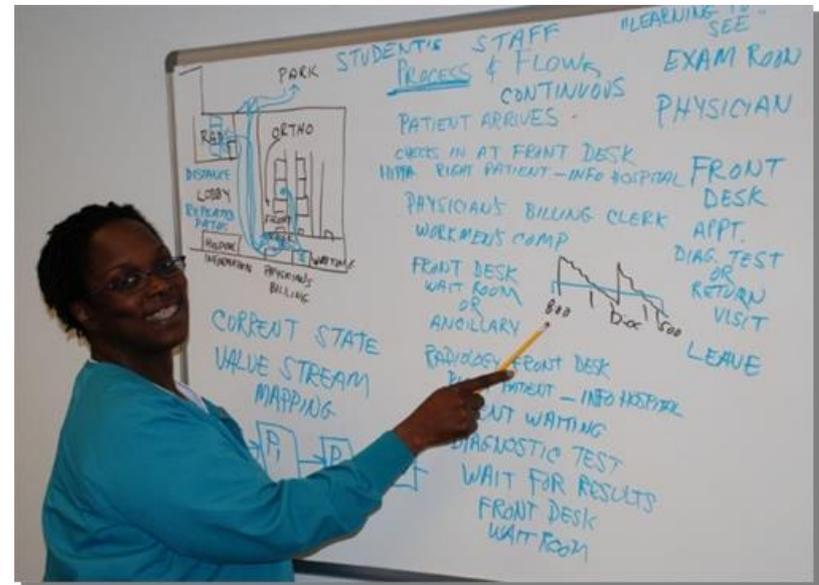
Step: Implement the new process

Future State Process Map:
Mental Health Assessment & Therapy Services

STUDENT FLOW:

| Arrive for appointment / Complete client record forms | → | WAIT for counselor | → | Student participates in Consultation & Assessment session | → | WAIT for appointment | → | Student participates in therapy session |

| Student Time | 30 minutes | 15 minutes | 50 minutes | 2.5 days | 50 minutes |

PROVIDER FLOW:

| Student greeted and given client record forms to complete | → | Counselor escorts student to office / Counselor reviews paperwork | → | Counselor leads Consultation & Assessment session / Counselor schedules therapy appointment | → | Counselor leads therapy session |

Value-Added Time ▢ (gray)
Wasted Time ▢ (white)

PERFORMANCE METRICS (Expected)

Total Student Time:	22.4 hours
Value-Added Time:	2.2 hours
Value-Added/Total Time:	10%
# Unscheduled Emergency C&A appointments (Fall semester)	50% fewer
% "No-Shows" for initial C&A session	0%

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Benchmark the Improved Process

Current "Is Now" Process:
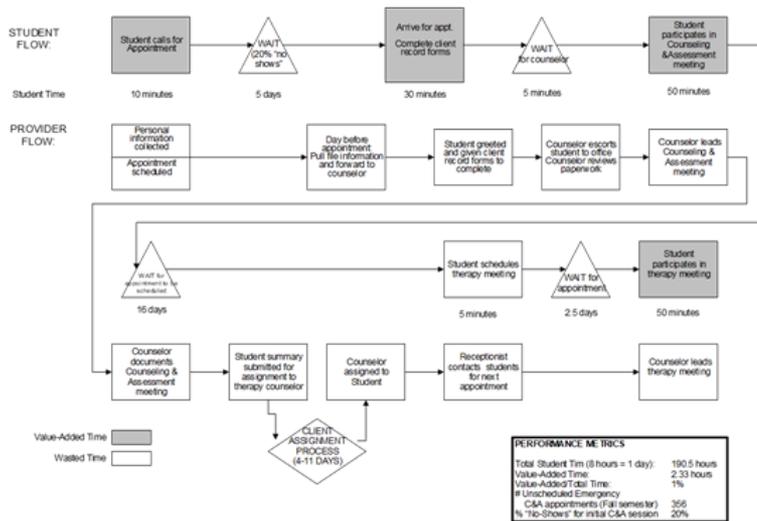
Future "Should Be" Process:
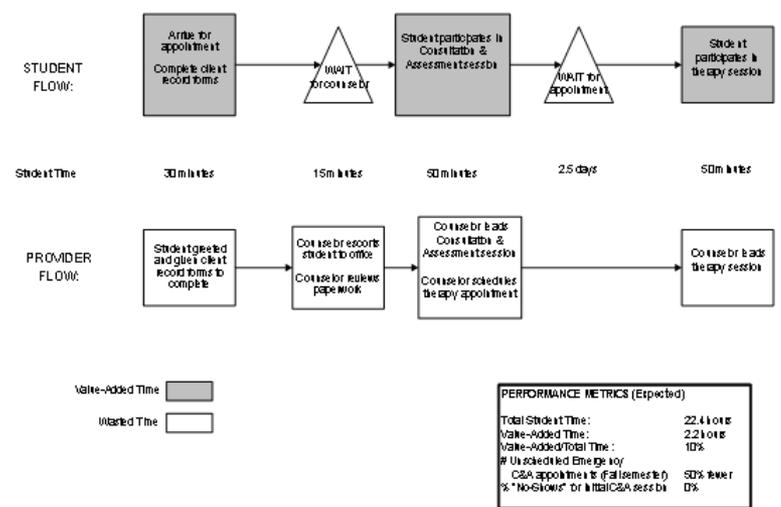
BGSU Counseling Center Project
Problem: Long wait for student counseling services

	Before	After	% Improvement
Student waiting time until initial appointment (days)	5 days	< .1 (same day)	99.8%
Student waiting time from initial appointment to assignment to counselor (days)	16 days	< .1 (same day)	99.9%
Number of emergency counseling service interviews	356	213	40.2%
% "No Shows" for consultation & assessment interviews	20%	< 1%	95.0%
Number of students requesting counseling services	761	950	24.8% increase
Number of counseling staff	12 FT 1 PT	12 FT 1 PT	NO INCREASE

Rapid Improvement Event (RIE) Performance Scorecard

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Benefiting Employees:
U Iowa Faculty/Staff Hiring Process

Problem: Hiring process too slow and complex

	Before	After	% Reduction
Steps in hiring process	30	25	17%
Work time by customers (hours)	94.8	43.7	54% ⭐
Number of hiring application attachments	(unspecified)	(unspecified)	75%
Length of time needed to complete the hiring process (days)	45	30	33%
Number of and type of errors made in new hiring process	Now tracked for ongoing continuous improvement of the process		

Rapid Improvement Event (RIE) Performance Scorecard

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Benefiting Faculty/T&L:
U Strathclyde Curriculum Changes

Problem: Not complying with established quality requirements

Measure	Before	After	Difference
Late Submissions	72%	0%	100% reduction ⭐
Returned for Corrections	82%	0%	100% reduction ⭐
Retrospective Curriculum Changes	36%	0%	100% reduction
Staff Time Spent on Approval Process			55% reduction

Rapid Improvement Event (RIE) Performance Scorecard

Benefiting Facilities:
U Central Oklahoma Work Order Process

Problem: Slow repairs of facilities

	Before	After	% Improvement
# Pieces of paper generated per order	19	2	**88.4%**
Annual paper cost	$15,597	$1,262	**91.9%**
Travel path of work order	1265 ft.	253 ft.	**80.0%**
Avg. # Touches	28	5	**82.1%**
Avg. # days until work order assigned	24.1	2.6	**89.2%**
Backlog of Work Orders	3000	< 300	**90%** ⭐

Rapid Improvement Event (RIE) Performance Scorecard

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General Findings

- **LHE benefits all HE constituencies:** Students and parents, faculty and staff, administrators and oversight boards, etc.

- **Multiple pathways to LHE success:** With or without support from top leadership, with or without a formal office to lead LHE, using RIEs or other applications of LHE (e.g., LDW), etc.

- **LHE journey can have multiple starting and ending points:** Voluntary adoption in limited areas vs. institution-wide adoption, centralized vs. decentralized, include academic processes vs. limited to support processes, etc.

- **Success across countries, cultures, and HE systems:** Public vs. private, western vs. non-western, 2-year vs. 4-year, etc.

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Improvements on Metrics That Matter: Miami University of Ohio

LHE efforts (since inception in 2011 through May 2019):

- Number of Lean Ideas Submitted: 1853

- Number of Projects Completed: 1514

- Cost Reduction: $27.5M*

- Cost Avoidance: $42.6M*

- Revenue Generated: $13.1M*

Note. Calculated savings for first year of LHE project, providing a conservative estimate of financial impact on the university

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Improvements on Metrics That Matter: University of Strathclyde (UK)

Documented improved performance against strategic key performance indicators:

- Cumulative Number of Improvements: Over 4000

- Staffing Capacity Released **Annually**: 27,000 Hours (i.e., the equivalent of 675 weeks of full-time work or 13.5 FTE employees)

- **Annual** Efficiency Savings: £450,000 ($585K)

- Increase to University Revenue: £15 Million ($19.5M)

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LHE: A New Mindset to Execute HE Strategy

#1 LHE rethinks the historical costing model

Historical: Tuition = Cost + Net Revenue vs. LHE: Tuition – Cost = Net Revenue

<u>Focus on cost reduction</u> for savings/strategic investment

#2 LHE "Non-Zero Sum" approach: Operational tactics for doing more with less

Engaging employees' minds in LHE problem-solving approach (continuous improvement, remove waste) to <u>use fewer and fewer resources while adding more value to beneficiaries</u>

#3 LHE is "fast and nimble:" Accelerating the speed of change

Teams are "deputized" to <u>implement changes immediately</u> following the 3-5 day Rapid Improvement Event

#4 LHE executes strategy using a common "problem-solving" management system

<u>Comprehensive, integrated, and proven problem-solving process</u> for choosing, diagnosing, and fixing broken processes

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LHE: Commitment to Continuous Improvement

- **SIMPLER:** Fewer process steps

- **FASTER:** Shorter process time

- **BETTER:** For students, faculty member, employees in the process, and colleges/system

- **CHEAPER:** Cost reduction, cost avoidance, and revenue generation

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LHE: Commitment to Respect for People

- Acknowledging the expertise and ideas of all employees (especially those involved in the process)

- Professional growth and development: LHE knowledge and skills for all employees

- Improved job enrichment, responsibility, communication, and decision making

- Reduced stress/burnout

- Improved engagement/satisfaction

The Promise of LHE

- Focuses on the individuals we serve, not ourselves

- Empowers all employees involved in the process to help improve it

- An integrated set of principles & practices that have been demonstrated to work

- Can be implemented across institution/system or in areas ready to embrace LHE

OVERALL: Win-Win-Win for beneficiary, employee, and institution/system

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Start Your LHE Journey Today

It doesn't matter where you start or how you start – just start!
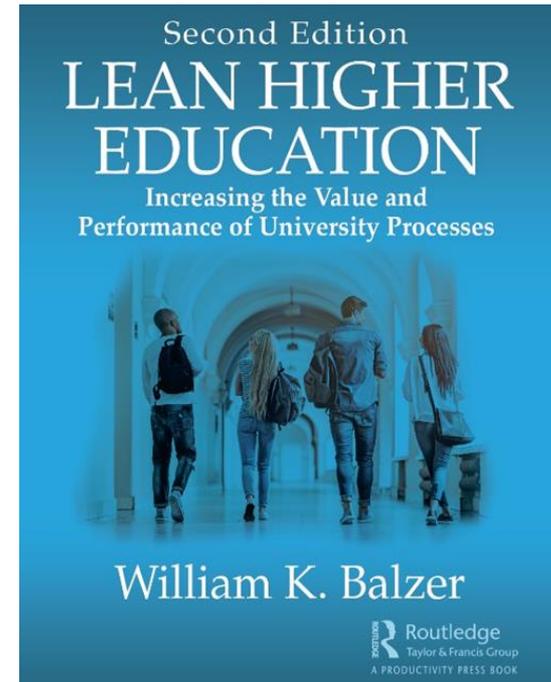
Lean Higher Education:

Increasing the Value and Performance of University Processes 2nd Edition (2020)

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What do you think?

Thanks for your attention and

have a great ProcessPalooza!