

# LEAN HIGHER EDUCATION

## Lean In Public Sector Annual Conference Keynote Address (virtual)

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*Lean Six Sigma Black Belt*

# The Need for Change in HE

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Funding challenges

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Accountability to our “beneficiaries”

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Accountability to our “sponsors”

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Competitive advantage in an increasingly competitive marketplace

# Traditional Responses

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## Traditional Reactive Responses

Stay the course: Challenges are transitory

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Cross your fingers: Continue to operate on “cost-plus” basis

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## Traditional Proactive Responses

Get through today: Plans of action for the near future (e.g., early retirement incentive, sweep budgets)

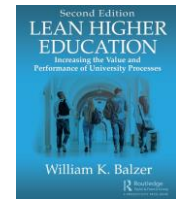
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Plan your way out: Bold plan (new mission, university-wide initiatives, strategic plan, culture shift) driven by leadership

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# An Alternative Response: Lean Higher Education (LHE)

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***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)

# Lean Evolution: Beyond Manufacturing

NAICS 2017 Sectors (Balzer et al. 2019)

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- 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

Balzer, W.K., Brodke, M., Kluse, C., & Zickar, M. (2019). Revolution or Thirty Year Fad? A Role for I-O Psychology in Lean Management. *Industrial and Organizational Psychology*, 12(3), 215-233.

# 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)**

# Why Lean Higher Education?

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- 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**

# LHE Improving Many HE Processes

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- **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



# The Breadth of LHE Applications for Improving HE Institutions & Systems

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- 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)

# Supported by Lean Tools & Practices

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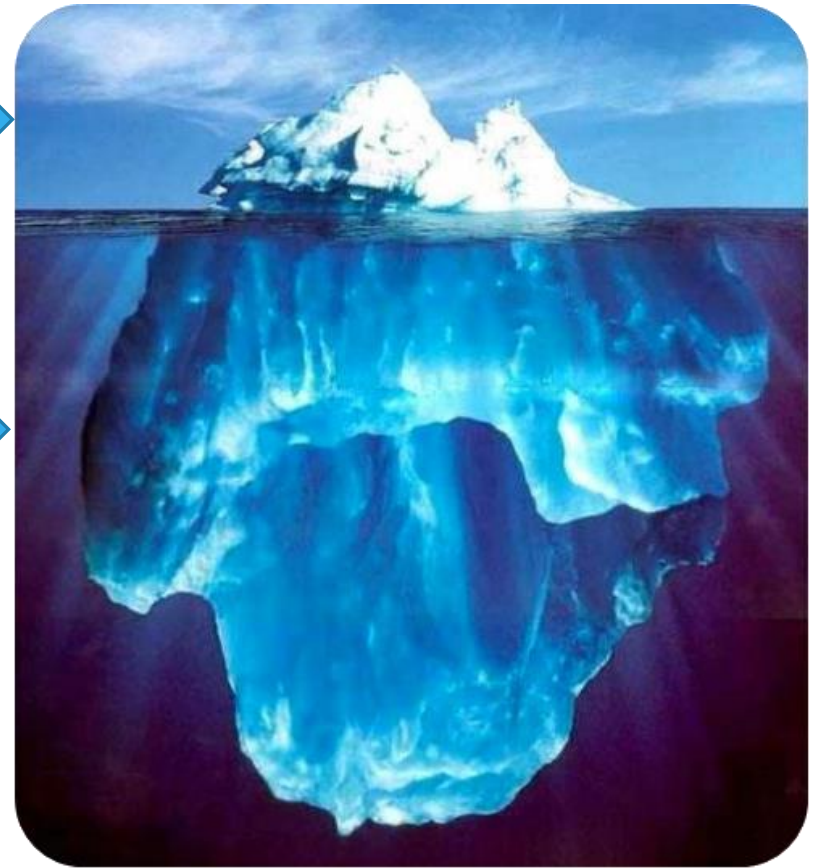
<i>Prioritization matrix</i>	<i>SIPOC/BOSCARD scoping chart</i>	<i>Team/project charter</i>
<i>1-page template</i>	<i>“Go and see” walk the process</i>	<i>Voice of customer</i>
<i>Kano analysis</i>	<i>Benchmarking</i>	<i>Benefits exploration map</i>
<i>CTQ requirement</i>	<i>Data collection plan</i>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

# Learning to See: Waste

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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



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

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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 no new resources assumed
4. Implement the new process and evaluate performance against established metrics
5. Achieve perfection through **continuous improvement** & radical transformation of process (& maybe resources later)

# Case Studies of LHE: Project Examples

(Balzer 2010; 2020)

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**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

# BGSU Counseling Center Project

## Problem: Long wait for student counseling services

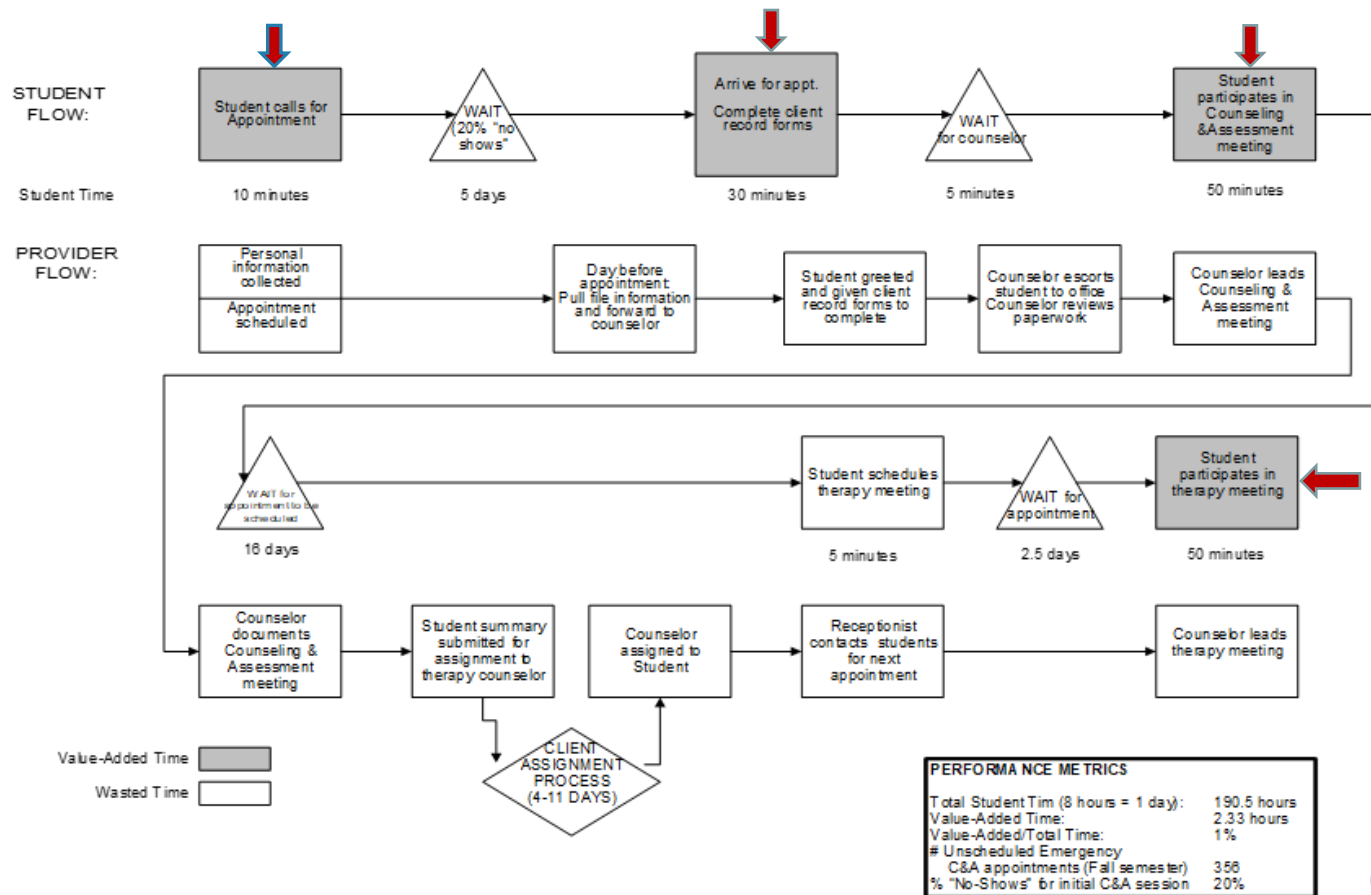
### *Step: Scope the Process*

- 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&A process.



# 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!)** 

# Step: Remove waste and improve flow

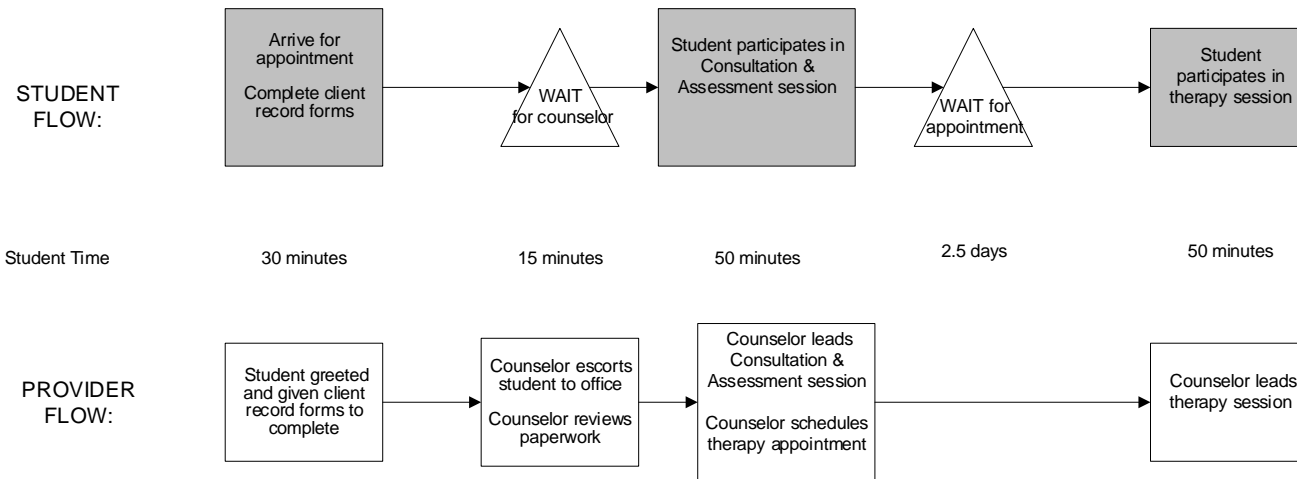
Propose & implement solutions

- 41 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)



# Step: Implement the new process

## Future State Process Map: Mental Health Assessment & Therapy Services

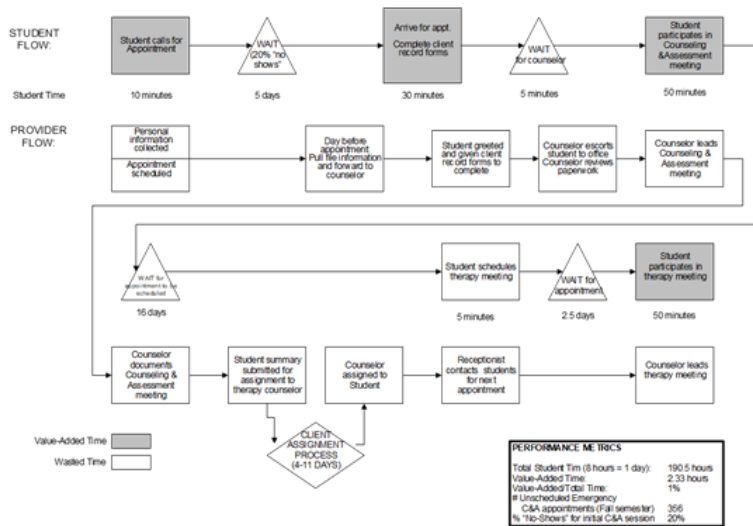


Value-Added Time   
Wasted Time

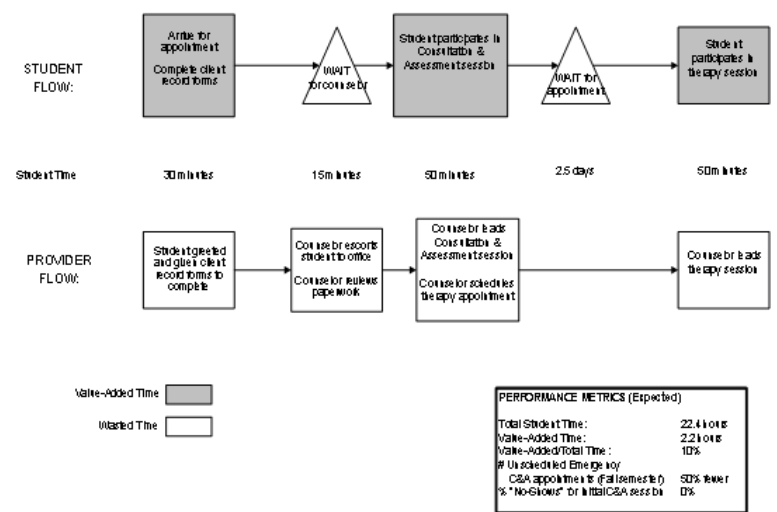
PERFORMANCE METRICS (Expected)	
Total Student Time:	22.4 hours
Value-Added Time:	2.2 hours
Value-Added/Total Time:	10%
# Unscheduled Emergency C&A appointments (Fall semester)	50% fewer
% "No-Shows" for initial C&A session	0%

# 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



# 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		


# 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

# 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% 



# Improvements on Financial Metrics: Miami University of Ohio

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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*

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

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Documented improved performance against strategic key performance indicators:

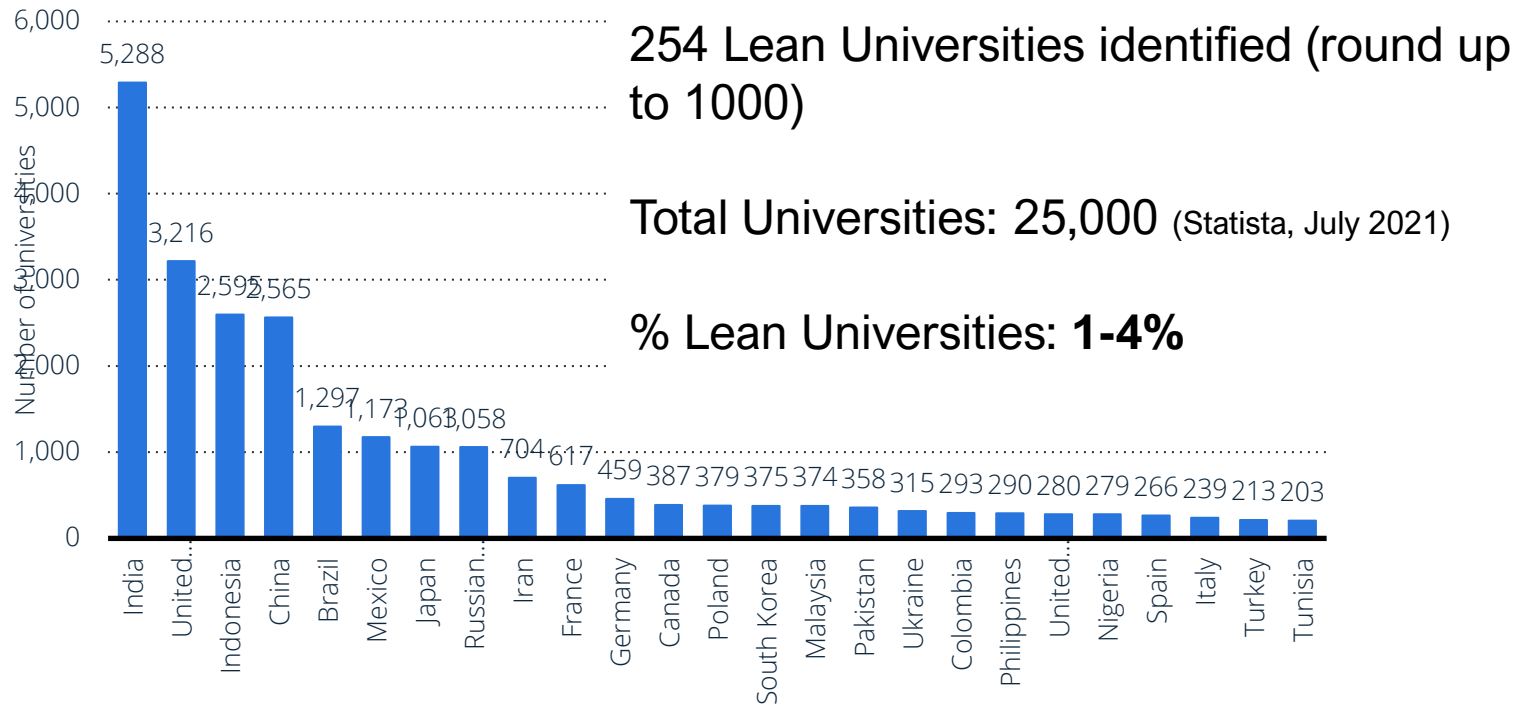
- Cumulative Number of Improvements: Over 4000
- Staffing Capacity Released **Annually**: 27,000 Hours (i.e., the equivalent of 675 weeks of full-time work or 13.5 FTE employees)
- **Annual** Efficiency Savings: £450,000 (\$585K)
- Increase to University Revenue: £15 Million (\$19.5M)

# General Findings

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- **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.

# Penetration of LHE: So Many Universities, So Little Lean



# WHY So Few LHE Institutions?

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## Potential Barriers

- No Accepted Pro Forma For Calculating Benefits of Lean HE
- “Cost Plus” HE Funding Model
- “HE Is Not A Business”
- “Students Are Not Products:” Lean Not Applicable In HE Core Function
- HE Decentralized Governance
- Resistance To Large-Scale Change
- Scalability of Lean
- HE Culture

## Possible Enablers

- Nemawashi: Prepare People and Institution (Loosen The Soil Around The Roots)
- “Burning Platform:” The Need For Change Is Here
- Tuition – Cost = Net Revenue
- Exemplars Of Success in HE And Healthcare
- Pilot Programs: Academic Support Areas And Biggest Pain Points
- Focus On 15% Early Adopters to convince 70% Skeptics; Ignore 15% Resistors

# The Promise of LHE

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- 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**

# Start Your LHE Journey Today

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*It doesn't matter where you start or how you start – just start!*

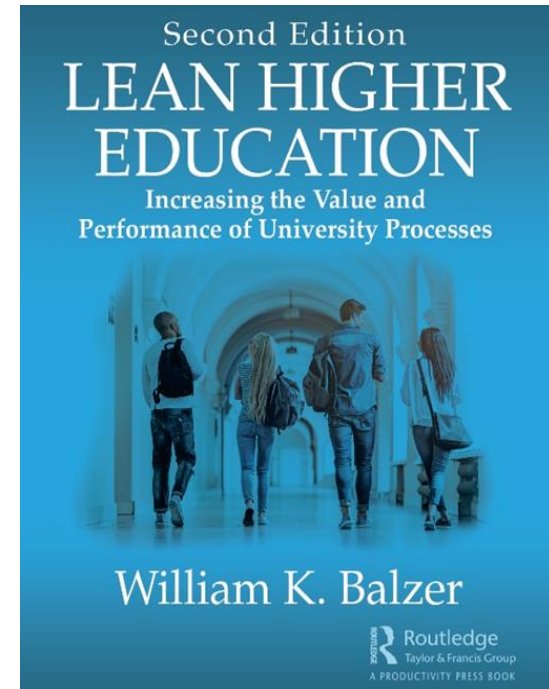
**Lean Higher Education:  
Increasing the Value and  
Performance of University  
Processes 2<sup>nd</sup> Edition (2020)**

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# What do you think?

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Thanks for your  
attention and  
have a great  
conference!

