



Designing and Deploying Lean Healthcare Curriculum

Earl M. Murman
Jackie Candido
LAI Knowledge Exchange Event
April 21, 2011

Meet the Speakers



Earl I. Murman

MIT Ford Professor of Engineering Emeritus
Director of the LAI Educational Network
PhD in Aerospace Engineering
Interests: Lean Six Sigma; STEM education,
healthcare, systems & aerospace engineering



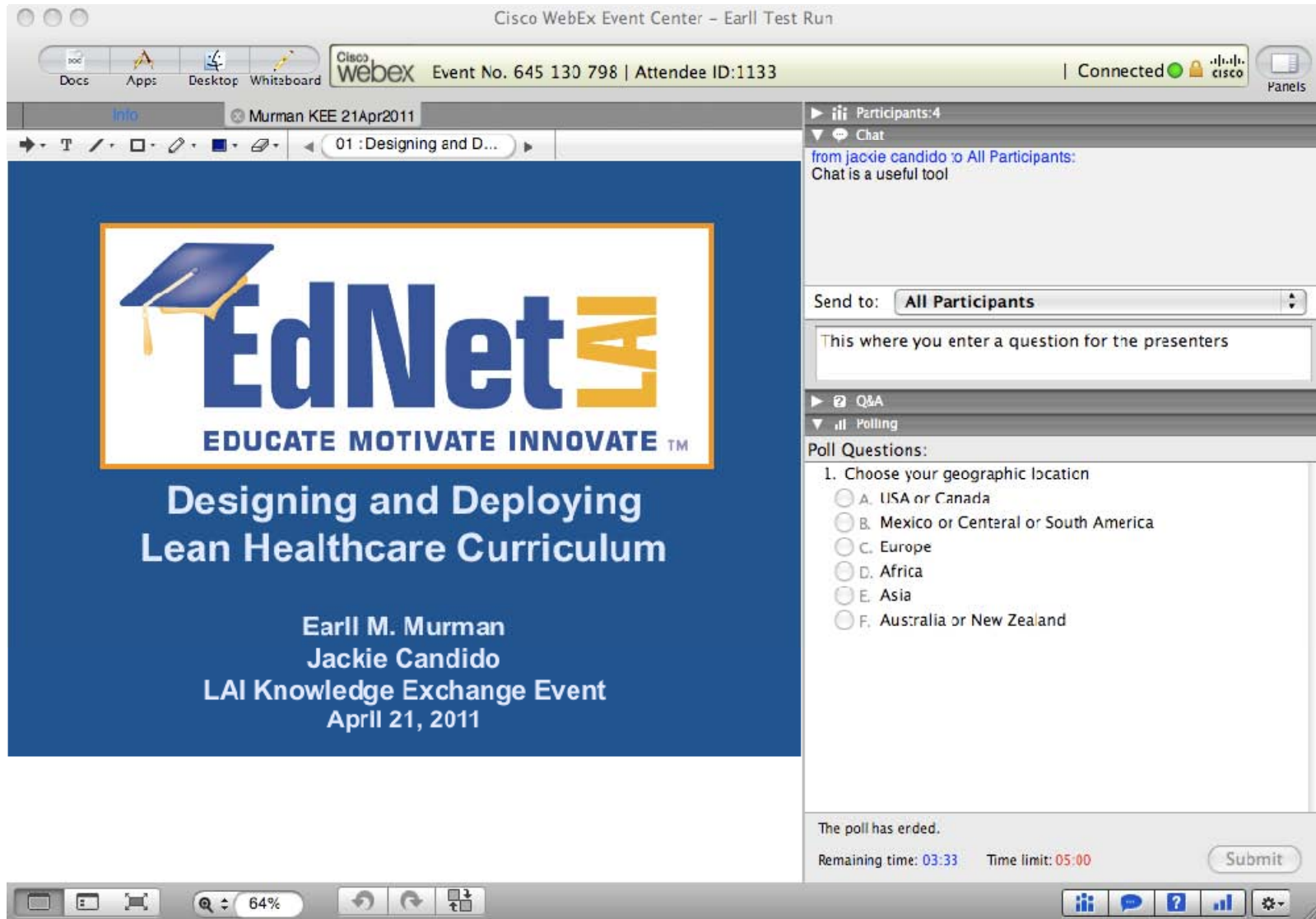
Jackie Candido

Associate Director of the LAI Educational
Network for Educational Initiatives
PhD in Educational Leadership and Learning
Technology
Interests: Curriculum design; distance learning;
instructional technology for vision impaired
learners.

Session Objectives

At the end of this session, you will be able to:

- **Identify the Lean Advancement Initiative, its Educational Network and the LAI Lean Academy courses**
- **Use or adapt the VALUE PIL methodology for self assessment of student proficiency**
- **Describe the importance of aligning course content with learning objectives**
- **Report on one instance of lean healthcare curriculum development and deployment**



Cisco WebEx Event Center - EarlI Test Run

Event No. 645 130 798 | Attendee ID:1133 | Connected

Participants:4

Chat

from jackie candido to All Participants:
Chat is a useful tool

Send to: All Participants

This where you enter a question for the presenters

Q&A

Polling

Poll Questions:

1. Choose your geographic location

- A. USA or Canada
- B. Mexico or Central or South America
- C. Europe
- D. Africa
- E. Asia
- F. Australia or New Zealand

The poll has ended.

Remaining time: 03:33 Time limit: 05:00 Submit

64%

Audience Geographic Profile

Select the letter that represents your geographic location and enter it in the poll

- A.** United States or Canada
- B.** Mexico or Central or South America
- C.** Europe
- D.** Africa
- E.** Asia
- F.** Australia or New Zealand



Audience Occupation Profile

In the poll on the right, check one or more of the following choices that represent your professional occupation

- A.** Healthcare professional (MD, RN,)
- B.** Healthcare administrator
- C.** Process improvement professional
- D.** Faculty member
- E.** Student
- F.** Other



Audience Curriculum Interests

In the poll on the right, check all the choices that represent your curriculum interest

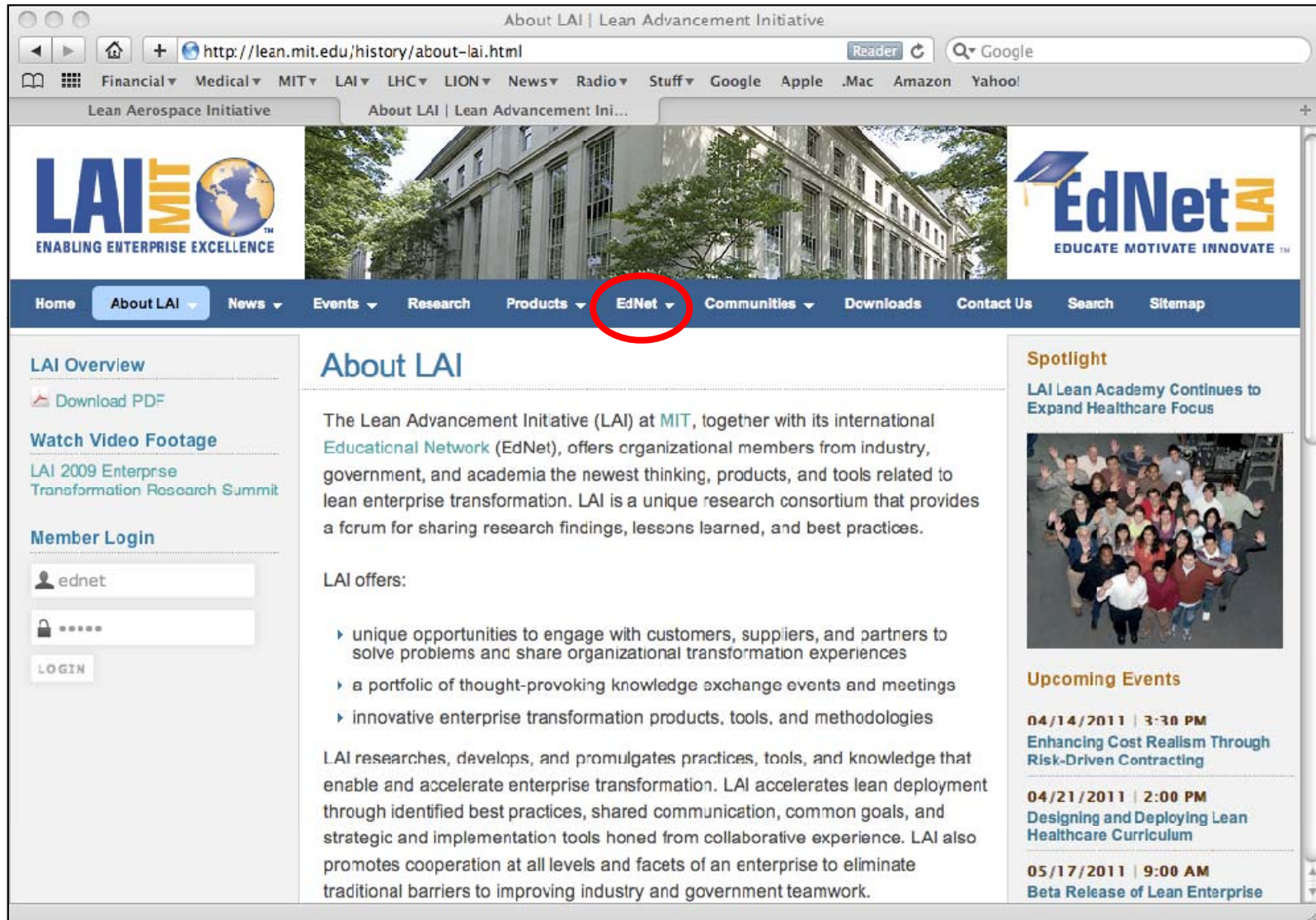
- A.** Awareness training – a few hours to a day
- B.** Readiness training – 3 to 5 days
- C.** Expert training – 6 mo. or more with project
- D.** Curriculum in degree granting program
- E.** Certificate program
- F.** Other



Agenda

- **Background – 15 min**
 - Audience profile
 - LAI, EdNet, LAI Lean Academy
 - Questions and discussion
- **Lean Healthcare curriculum – 40 min**
 - Beginnings
 - VALUE PIL assessment tool
 - Voice of Customer survey
 - Learning objectives
 - Course offerings & experiences
 - Questions and Discussion
- **Wrap up – 5 min**





The screenshot shows a web browser window displaying the 'About LAI | Lean Advancement Initiative' page. The browser's address bar shows the URL <http://lean.mit.edu/history/about-lai.html>. The website header features the EdNet LA logo on the right and the LAI MIT logo on the left, with the tagline 'ENABLING ENTERPRISE EXCELLENCE'. A navigation menu is located below the header, with the 'EdNet' dropdown menu highlighted by a red circle. The main content area is titled 'About LAI' and contains the following text:

The Lean Advancement Initiative (LAI) at MIT, together with its international Educational Network (EdNet), offers organizational members from industry, government, and academia the newest thinking, products, and tools related to lean enterprise transformation. LAI is a unique research consortium that provides a forum for sharing research findings, lessons learned, and best practices.

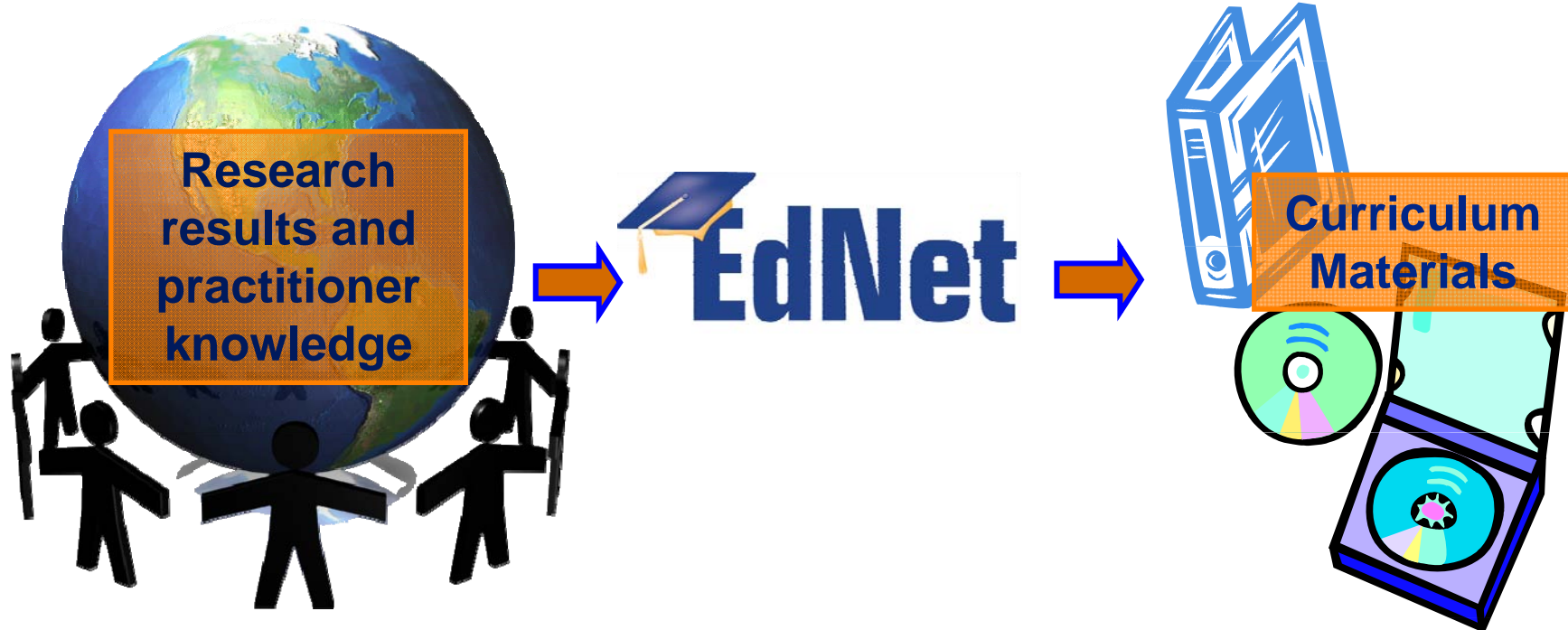
LAI offers:

- ▶ unique opportunities to engage with customers, suppliers, and partners to solve problems and share organizational transformation experiences
- ▶ a portfolio of thought-provoking knowledge exchange events and meetings
- ▶ innovative enterprise transformation products, tools, and methodologies

LAI researches, develops, and promulgates practices, tools, and knowledge that enable and accelerate enterprise transformation. LAI accelerates lean deployment through identified best practices, shared communication, common goals, and strategic and implementation tools honed from collaborative experience. LAI also promotes cooperation at all levels and facets of an enterprise to eliminate traditional barriers to improving industry and government teamwork.

On the right side of the page, there is a 'Spotlight' section titled 'LAI Lean Academy Continues to Expand Healthcare Focus' with an accompanying photo of a group of people. Below this is an 'Upcoming Events' section listing three events:

- 04/14/2011 | 3:30 PM**
Enhancing Cost Realism Through Risk-Driven Contracting
- 04/21/2011 | 2:00 PM**
Designing and Deploying Lean Healthcare Curriculum
- 05/17/2011 | 9:00 AM**
Beta Release of Lean Enterprise



Integrating lean into education

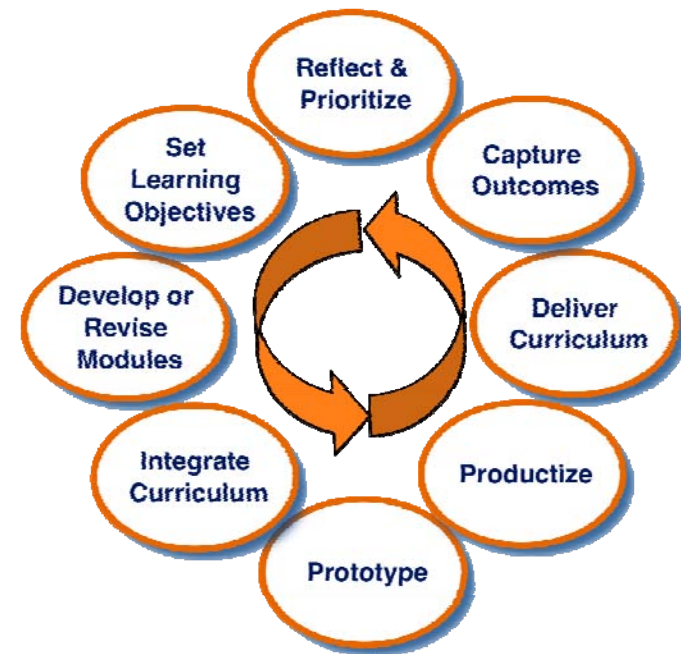
Co-host Annual Lean Educator Conference



**Keynote speakers,
contributed presentations,
workshops, plant tours**

Major EdNet Activities

Collaborative Curriculum Development



**Creating shareable
curriculum and deploying
in multiple venues**

LAI Lean Academy® Course

Three day short course for Lean Enterprise fundamentals



MIT OpenCourseWare | Aeronautics and Astronautics | 16.660 Introduction to Lean Six Sigma Methods, January IAP 2008 | Home

MIT OPEN COURSEWARE
MASSACHUSETTS INSTITUTE OF TECHNOLOGY

Home Courses Donate About OCW Help Contact Us

16.660 / 16.853 / ESD.62J Introduction to Lean Six Sigma Methods

As taught in: January IAP 2008

Level: Undergraduate / Graduate

Instructors: Prof. Earl Murman, Hugh McManus, Al Haggerty, Prof. Annalisa Weigel

Course Features: Course Description, Technical Requirements

Students working together on an implementation exercise. (Photograph by Hugh McManus.)

Course Features: Video lectures

Over
88,000
video
views

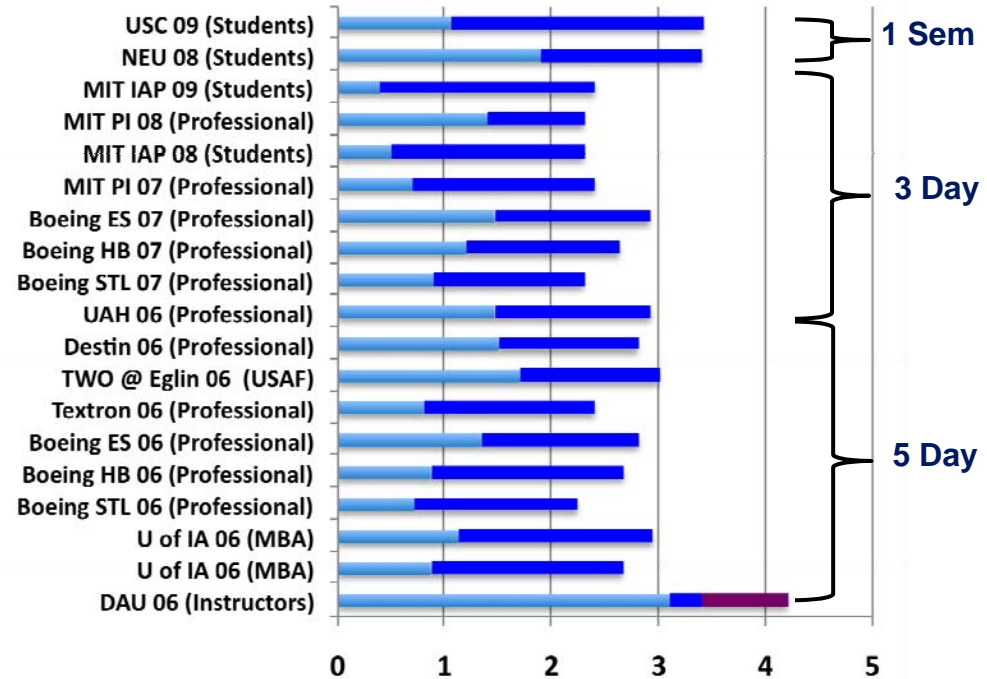


Lean Six Sigma Concepts Covered in LAI Lean Academy Course

- Processes
- Value
- Value stream
- 7 types of waste
- 5 S
- Flow
- Cycle time
- Takt time
- Balanced work
- Single piece flow
- Standard work
- Kitting
- Pull System
- Kanban
- Visual control
- Mistake proofing
- Three elements of collaboration
- Andon
- VSM
- Lean supply chains
- IPTs
- A3 charts
- SPC
- Six Sigma
- DFSS
- Process quality
- Kaizen
- Product quality
- Enterprises
- Stakeholders
- Internal customers
- External customers
- Process maps
- Leadership and management
- Price vs cost
- DFMA
- IPPD
- Hybrid supply chain
- Key characteristics
- DPMO
- 5 whys
- DMAIC
- Cp vs. Cpk
- Histograms
- Scatter Diagram
- Pareto chart
- PICK charts
- Product lifecycle
- Value added time
- And more.....

Graduate's Lean Proficiency

■ Before ■ Gain ■ Instructing



LAI Lean Academy Self-Assessment Proficiency Scale

0	UNAWARE	To have no exposure to or knowledge of...
1	AWARE	To have experienced or been exposed to...
2	READY	To be able to participate in and contribute to...
3	CAPABLE	To be able to understand and explain...
4	SKILLED	To be skilled in the practice or implementation of...
5	EXPERT	To be able to lead or innovate...

What we Learned

- Audience proficiency reaches **READY** to **CAPABLE** after 3 day curriculum
- Curriculum fits multiple audiences
- 50/50 mix of active learning and lecture is effective
- Collaborative development and delivery worked well
 - Over 30 instructors
 - Adopted in toto or in fragments at about 15 schools

A Core Curriculum for Multiple Deployments

Questions and Discussion on Background Topics

LAI Lean Healthcare Academy Beginnings

- **Spring 08 – Early thinking about 3 day healthcare course modeled on LAI Lean Academy**
- **August 09 – Conceptualized course during summer workshop at Purdue**
 - **Target Audience: Multifunctional Healthcare Teams**
- **Fall 09 – Instructor team formed & benchmarking**
- **Winter 09 – Conducted Voice of Customer survey, set course learning objectives, designed content**
- **Spring 09 – Developed curriculum**
- **June 09 – First offering: VA VISN1**
 - **38 participants spanning MD, RN, Process Improvement, Administration**

Multifunctional Instructor Team



Earl Murman, PhD
Prof. Emeritus
MIT Engineering



Deanna Willis, MD, MBA
Assistant Prof.
Indiana University
School of Medicine



Barrett Thomas, PhD
Assistant Prof.
Univ. of Iowa
College of Business



Whitney Walters, MSE
Lean Coach
Univ. of Michigan
Health System



Steven Shade, MS
Mg. Dir., Center for
Advanced Manufact.
Purdue Univ.

Simulation Team



Hugh McManus, PhD
Sr. Project Eng.
Metis Design



Annalisa Weigel, PhD
Assistant Prof.
MIT Engineering



Jackie Candido, PhD
Assoc EdNet Director for
Educational Initiatives

Coordinator & Educational Specialist

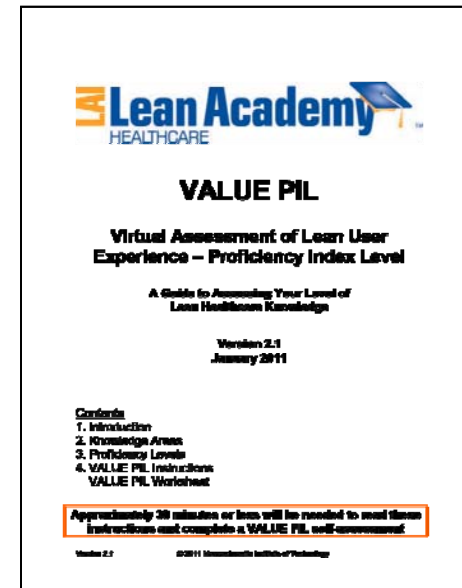
VALUE PIL Assessment Tool

LAI Lean Academy Self-Assessment Scale


0	Unaware	To have no exposure to or knowledge of...
1	Aware	To have experienced or been exposed to...
2	Ready	To be able to participate in and contribute to...
3	Capable	To be able to understand and explain...
4	Skilled	To be skilled in the practice or implementation of...
5	Expert	To be able to lead or innovate...

...Lean Healthcare Knowledge Areas

- 1 Context for Lean Healthcare
- 2 Healthcare enterprises
- 3 Lean Six Sigma fundamentals
- 4 Process and value stream fundamentals
- 5 Fundamental principles of Lean Thinking
- 6 Lean six sigma methods
- 7 Lean six sigma tools
- 8 Lean six sigma applications in healthcare
- 9 People and organizations in healthcare
- 10 Implementing lean in healthcare



VALUE PIL Assessment Worksheet



LAI Lean Academy® VALUE Worksheet

LEVEL	KNOWLEDGE AREA
<input type="checkbox"/>	Context for Lean healthcare: Healthcare quality & safety, access, and cost drivers; demonstrated benefits of lean in healthcare and other sectors.
<input type="checkbox"/>	Healthcare enterprises: Core and extended enterprises; patient, provider, employee, supplier and other stakeholders; stakeholder value
<input type="checkbox"/>	Lean six sigma fundamentals: flow, quality, muda, muri, mura; variability; continuous improvement; respect for people; Gemba, Gemba Genbutsu; lean is a journey, not a state; lean is a way of thinking, not a set of tools.
<input type="checkbox"/>	Processes and value streams fundamentals: inputs, outputs; process maps, value stream maps, takt, cycle, wait times, capacity, throughput, queuing; balanced work.
<input type="checkbox"/>	Fundamental principles of lean: customer value; value added, non-value added, value streams - people, material, information; single piece flow; pull; perfection
<input type="checkbox"/>	Lean six sigma methods: PDCA, 8D/8VA, VSMVA - current & future state; DMAIC; root cause analysis; A3 thinking; 5P, 5Q
<input type="checkbox"/>	Lean six sigma tools: 6S; 5 whys; 8 wastes; visual control; standard work; leanbar; 5Ming; check sheet; Pareto chart; cause and effect diagram; mistake proofing; spaghetti chart
<input type="checkbox"/>	Lean six sigma applications in healthcare: primary care; emergency care; inpatient; laboratory; administration; material management
<input type="checkbox"/>	People and organizations in healthcare: teamwork fundamentals; communication; relational coordination
<input type="checkbox"/>	Implementing lean in healthcare: RPIVC; Just-in-Time; Kanban; policy deployment; balanced scorecard; project selection & prioritization
<input type="checkbox"/>	TOTAL
<input type="checkbox"/>	AVERAGE = TOTAL / 10

LEVEL 0 – UNAWARE:
To have no exposure to or knowledge of
• Have I never heard about these topics at all?
• Have I only heard about these topics in casual conversation?

LEVEL 1 – AWARE:
To have experienced or been exposed to
• Have I had some organized introduction or instruction to these topics?
• Have I ever seen or read these topics in a book?
• Have I said myself what these topics really mean?

LEVEL 2 – READY:
To be able to participate in and contribute to
• Do I know enough about these topics that I can compare/contrast what other people mean?
• Can I participate in give-and-take dialog on these topics?
• Have I ever participated in an event when this topic was used?
• Did I contribute to the discussion or action surrounding this topic?

LEVEL 3 – CAPABLE:
To be able to understand and explain
• To whom could I explain these topics?
• What would I actually tell them?
• Have I ever actually explained any of these topics to someone else?
• Have I written something about these topics?
• Have I given a presentation where I explained these topics or needed these topics to explain about a lean activity?

LEVEL 4 – SKILLED:
To be skilled in the practice or implementation of
• Have I applied my knowledge in this area? How did I apply it?
• Was I able to improve enterprise value (revenue) by applying my knowledge in this area?
• Have I applied my knowledge more than once?
• Did I learn new things about this area by applying my knowledge?

LEVEL 5 – EXPERT:
To be able to lead or innovate in
• Have I ever led a lean activity in this area?
• Have I taught someone else about these topics?
• Have I discovered new knowledge that has improved lean practices in this area?

Version 2.1 © 2011 Massachusetts Institute of Technology 6

- Structured tool for the audience to self assess their lean proficiency
- Administered before and after the course
- Also used to design the course

Lean Concepts, Terms and Tools Introduced in LAI Lean Healthcare Academy

- 5 Whys
- 6S
- 8 wastes
- A3 thinking and tool
- Andon
- Balanced scorecard
- Balanced work
- C_p , C_{pk}
- Capacity, throughput, queuing, bottleneck
- Cause and effect diagrams
- Check lists/sheets
- Current state
- Customers (external & internal)
- Cycle time
- DMAIC
- Enterprise stakeholders
- Enterprises
- Flow
- Future state
- Gemba (Genba)
- Genchi Genbutsu
- Integrated teams
- Kanban
- Kitting
- Lean is a journey
- Lean is a way of thinking
- Little's law
- Mistake proofing
- Muda, muri, mura
- Non value-added time
- Pareto charts
- PICK charts
- Plan-do-study-act (PDSA)
- Policy deployment
- Process maps
- Processing time
- Pull
- Relational coordination
- RPIW
- Single piece flow
- Spaghetti diagrams
- Stakeholder value
- Standard work
- Takt time
- Three actuals
- Time value charts
- UCL, LCL
- USL, LSL
- Value added, non-value added, waste
- Value streams
- Value stream mapping and analysis (VSMA)
- Variation impact
- Visual control
- Voice of the customer
- Wait time
- and more

Audience Proficiency Poll

LEVEL 2 PROFICIENCY - READY:

To be able to participate in and contribute to . . .

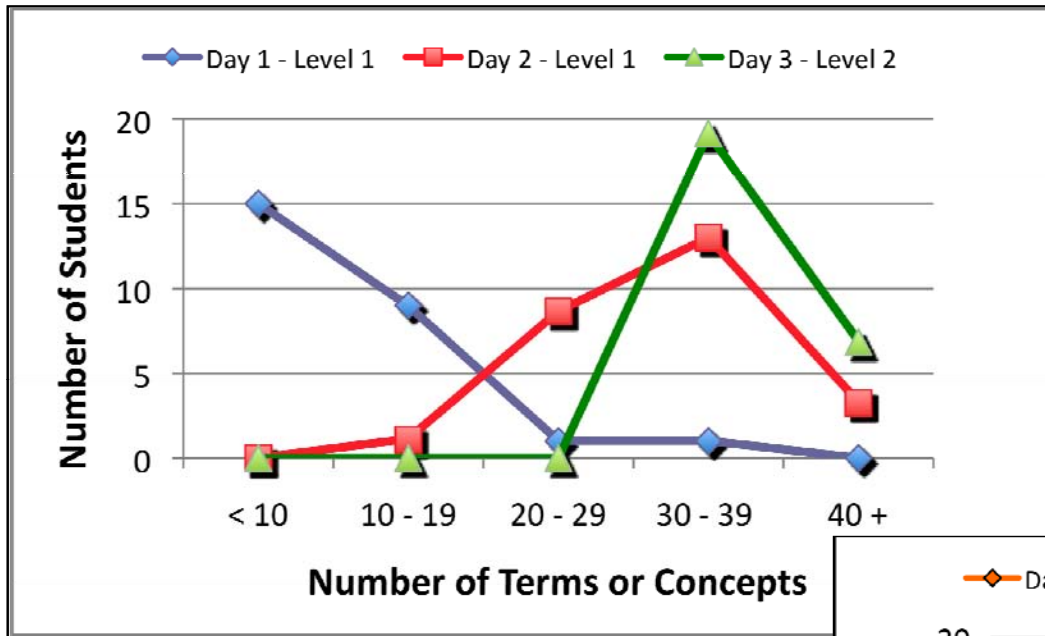
RUBRICS

- Do I know enough about these topics that I can comprehend what other people mean?
- Can I participate in give-and-take dialog on these topics
- Have I ever participated in an event when this topic was used?
- Did I contribute to the discussion or action surrounding this topic?

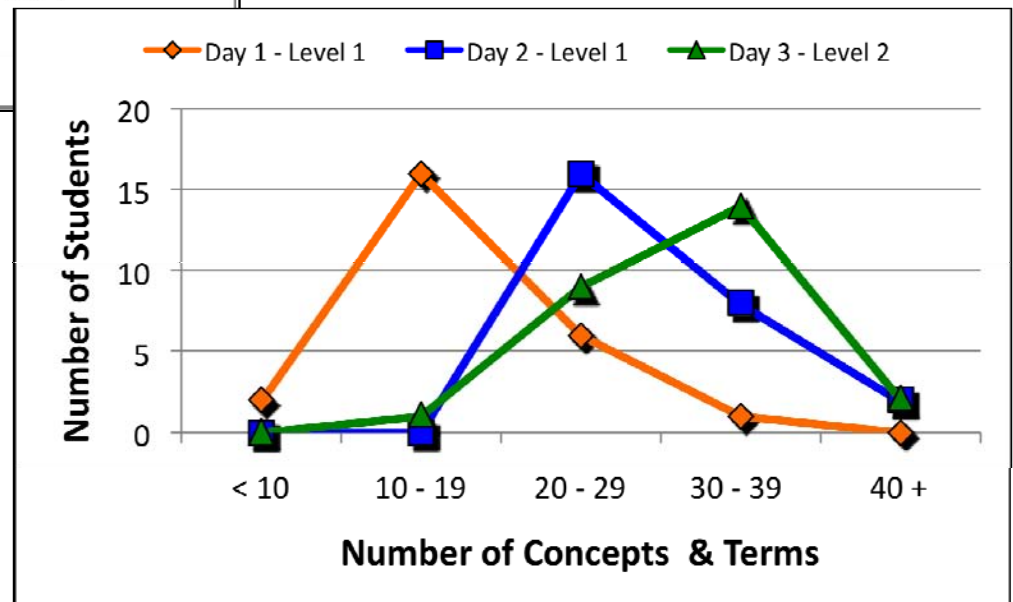
Count the number of items on the previous slide for which you can answer YES to one of the above rubrics

Examples of Class Progression

**Professionals
July 2010**



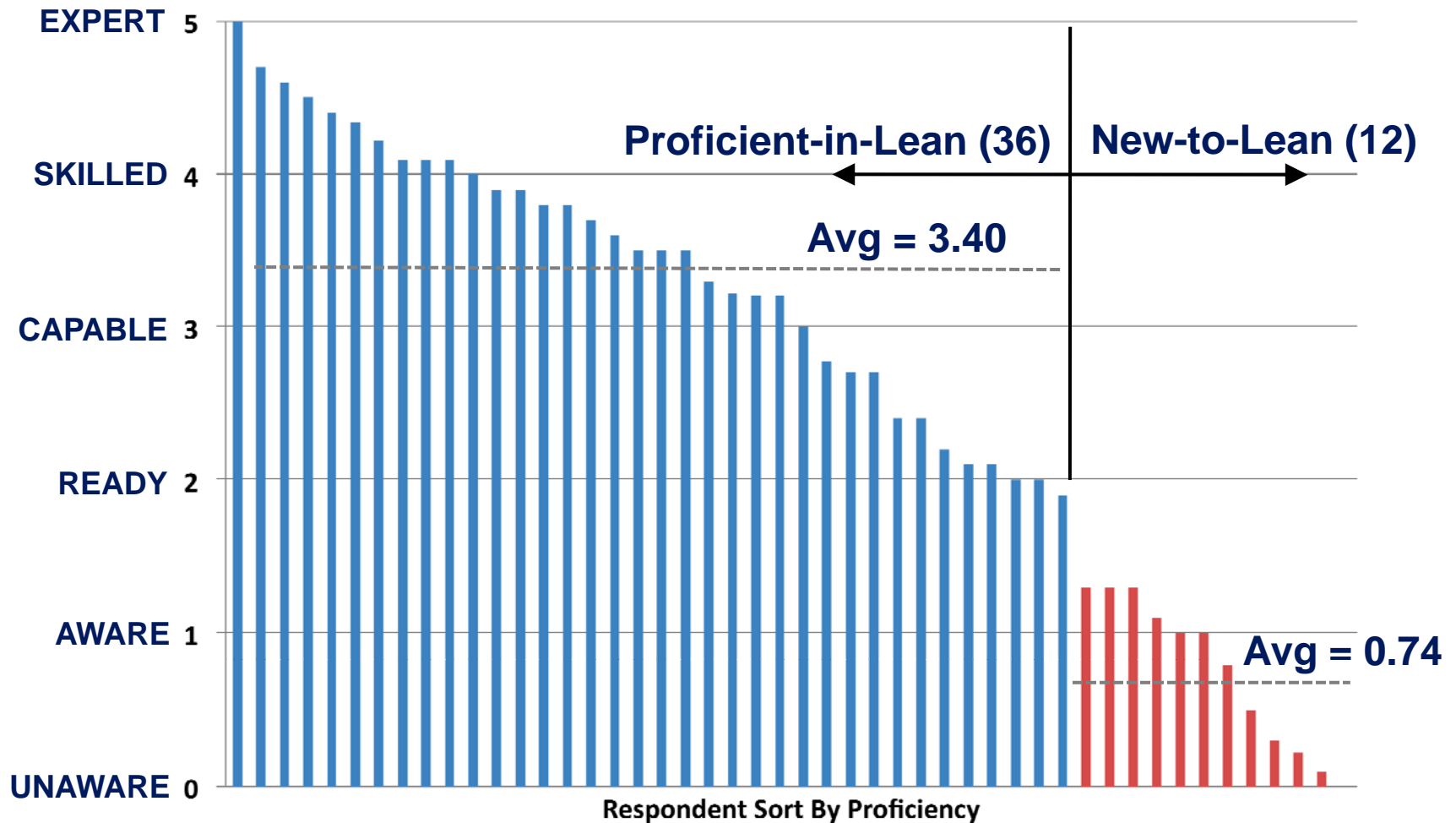
**MIT Students
Jan 2011**



Voice of Customer Survey

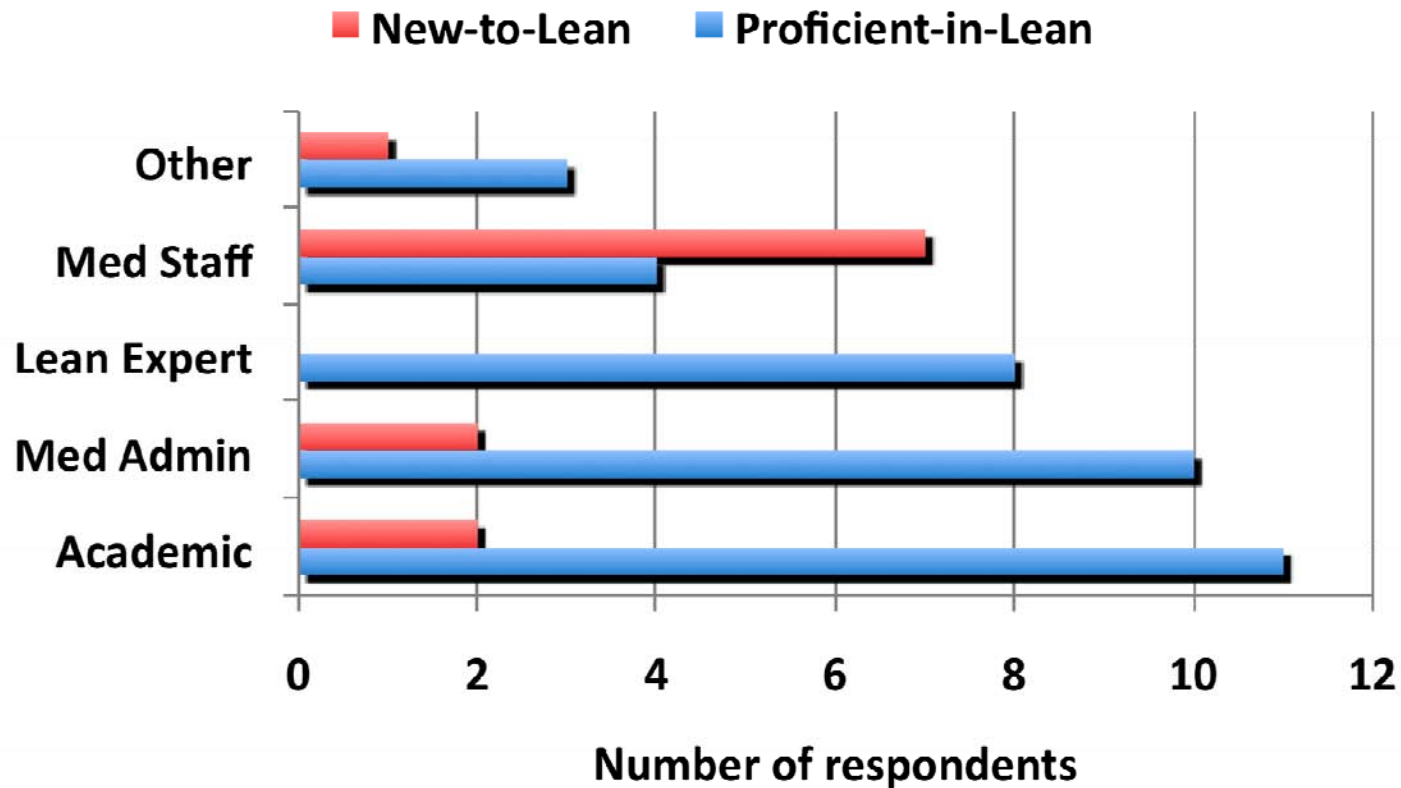
- Instructor team scoped potential course content into 10 Knowledge Areas comprising 99 possible topics
- Subject matter experts asked for their *desired level of proficiency* in these areas and topics for a *graduate of a three day introductory course*
 - Used LAI Lean Academy Proficiency Scale:
UNAWARE ... EXPERT
- Electronic survey distributed via networking
- 48 completed responses received

Proficiency of Respondents



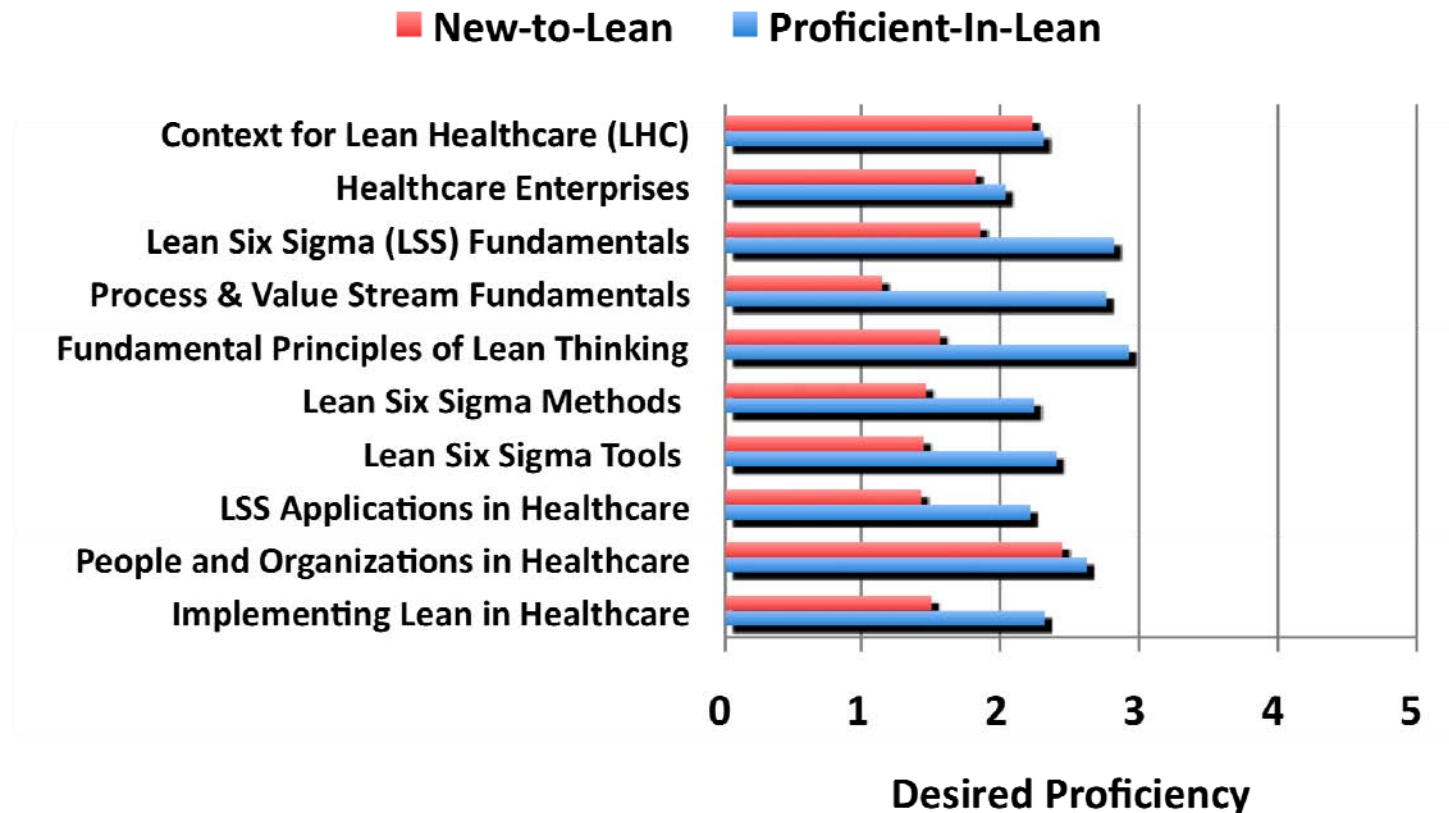
Two major subgroups – Pros and Newbies

Respondent's Domain Expertise



**Med Staff (MD, RN) dominated by Newbies
Three comparably sized groups of Pros**

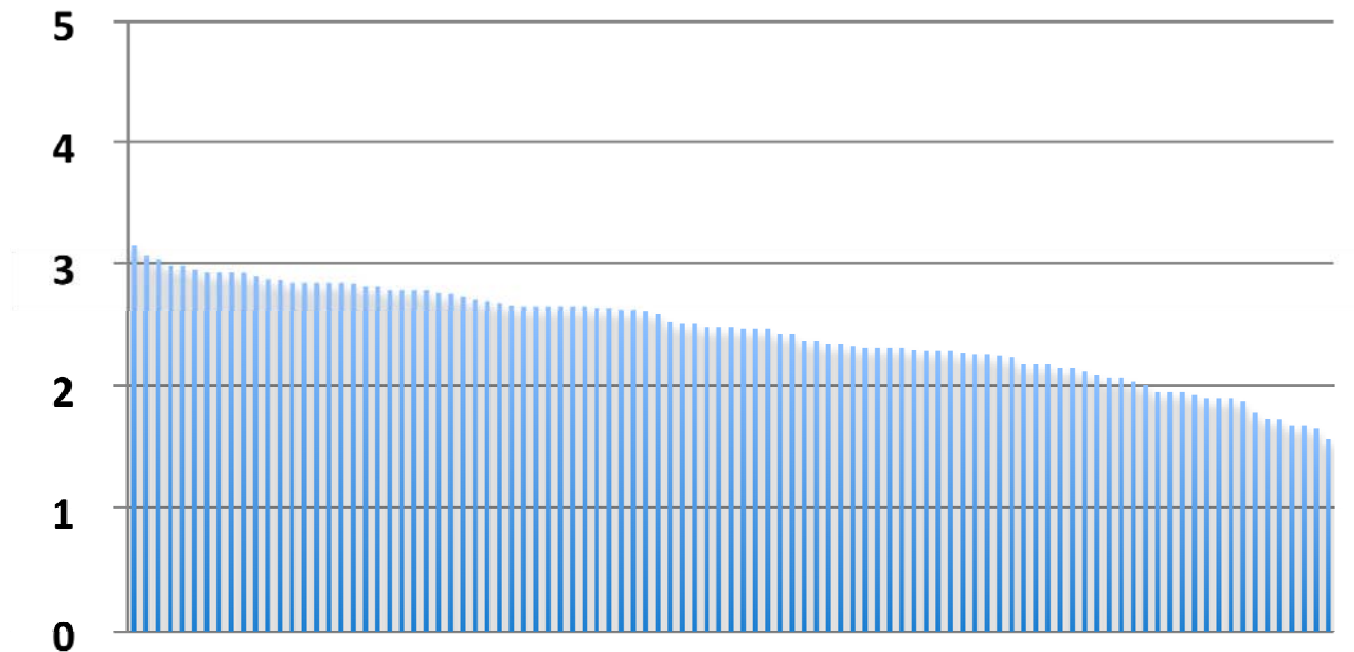
Desired Knowledge Area Proficiencies (Averaged over respondents, but significant variation)



- Pros desire greater proficiency than Newbies
- Pros emphasize Fundamentals over Methods, Tools, and Applications
- Newbies and Pros desire proficiency in People & Organizations

VOC on Specific Topics

Pro's Desired Proficiency of 99 Topics



**No demarcation between most & least important topics
Cannot cover all topics in 3 day course**

VOC survey was helpful guide for course developers

Learning Objectives (LOs)

- LOs developed for entire course and each module
- LOs should match desired level of proficiency
- Bloom's Taxonomy used as a guide
- LOs evolve iteratively with course & module content

Bloom's Taxonomy of Educational Objectives

Description	Sample verbs to use when writing learning objectives		
Knowledge <ul style="list-style-type: none"> • is defined as the remembering of previously learned material • represents the lowest level of learning • involves recalling or reciting: facts, observations, or definitions 	define record list repeat	identify name retrieve	
Comprehension <ul style="list-style-type: none"> • is defined as the ability to grasp the meaning of material • represents the lowest level of understanding • involves explaining, interpreting, or translating 	discuss summarize tell express extrapolate	report restate recognize locate translate	explain interpret describe review
Application <ul style="list-style-type: none"> • refers to the ability to use learned material in new and concrete situations • requires higher level of understanding than comprehension • involves applying: rules, methods, laws, principles 	demonstrate apply schedule illustrate	practice operate sketch use	
Analysis <ul style="list-style-type: none"> • refers to the ability to break down material into its component parts so that its organizational structure may be understood • represents a higher level than previous categories because of requirement of understanding of both the content and structural form of the material • involves analyzing relationships, distinguishing between facts and inferences, • evaluating data relevance 	authenticate decipher itemize distinguish analyze differentiate appraise calculate experiment	solve compare contrast criticize diagram inspect debate test	
Synthesis <ul style="list-style-type: none"> • refers to the ability to put parts together to form a new whole • represents creative behaviors, with emphasis on the formulation of new patterns or structures • involves proposing plans, writing speeches, creating classification schema 	compose design integrate construct organize	create assemble set up formulate arrange	manage plan prepare
Evaluation <ul style="list-style-type: none"> • is concerned with the ability to judge the value of material for a given purpose • represents highest level because of inclusion of elements of all other categories plus conscious value judgments based on criteria • involves judging logical consistency, • adequacy of data support for conclusions 	appraise grade qualify measure score estimate	judge evaluate rate compare assess choose	

Reference: Bloom, B.S., Englehart, M.D., Furst, E.J., Hill, W.H., and Krathwohl, D.R. (1956). *Taxonomy of Educational Objectives: The Classification of Educational Objectives. Handbook I: Cognitive Domain*, David McKay, New York.

Learning Objectives Example

At the end of this module, you should be able to:

- **Recognize PDSA and A3 Thinking as effective process improvement approaches**
- **Use a Continuous Process Improvement Framework for structured problem solving**
- **Apply VSM and basic lean tools to improve flow**
- **Utilize root cause analysis methods**
- **Describe the value of an A3 chart**

Class Poll – How many of these LOs are targeted at Bloom’s Application level of learning?

Curriculum Design Principles

- **Match content coverage and exercises with LOs and Bloom's levels of learning, e.g.**
 - Knowledge – Single slide could be adequate
 - Comprehension – More slides & simple active learning exercise
 - Application – Directed 20 to 30 min active learning exercise
 - Analysis – Opened ended extensive exercise
- **Revisit topic multiple times to achieve higher levels of learning, e.g. Value Stream Mapping**
 - Day 1 – Directed introductory active learning exercise
 - Day 2 – Opened ended application to Lego simulation
 - Day 3 – Accounts Payable case study with homework
- **Use actual exhibits for illustrations**
- **Make it fun!**

Day 1

Clinical Context

- Lean Fundamentals & Healthcare Context
- Seeing Process
- Guest Speaker
- Defining Value and Finding Waste
- Finding Bottlenecks & Enabling Flow
- Respect for People
- A3 Thinking & Exercise

I

Day 2

Patient VS Context

- Value: Patient Satisfaction & More
- VSMA Fundamentals and Application
- Variability and Six Sigma Basics
- Safety Tools & Topics
- Effective Communication
- A3 Thinking & Exercise

II

Day 3

Med Center Context

- Planning, Prioritizing, Justifying & Achieving the Future State
- A3 Exercise Wrap Up
- High Performance Healthcare
- Lean Healthcare Implementation
- Enterprise Guest Speaker

Course Cutting Integration Elements

Patient Flow Simulation Spanning Clinic to Med Center Context
Developing an A3 Plan for Student Contributed Improvement Target

Day 1 – Clinical Context



“The exercise and the ability to modify the parameters was very instructive”



Day 2 – Patient Value Stream Context

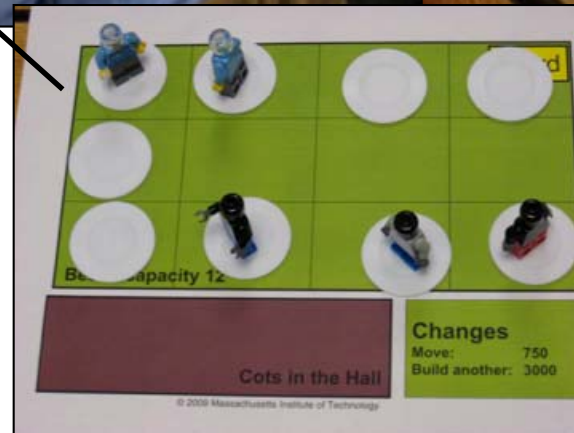


“Exercises seemed to be valuable – good active participation.”



Patients ready for admission

“Getting to the point of ‘drinking from a fire hose’ - info coming fast and furious.”



Photos by Jim Schlosser

Day 3 – Med Center Context



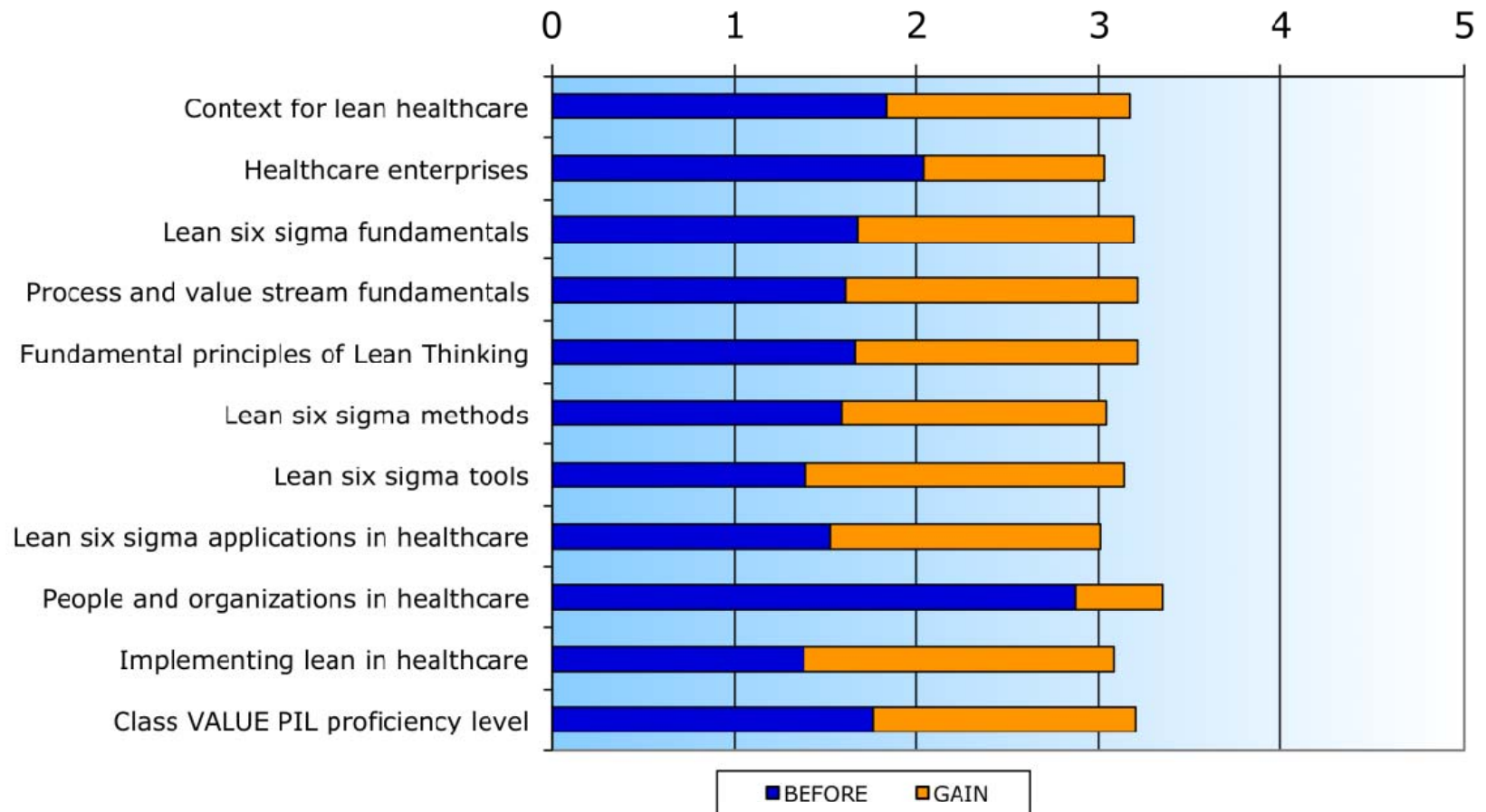
“I was very surprised that the sim worked out as well as it did.”



“Good examples of lean healthcare implementation.”

Before and After VALUE PIL

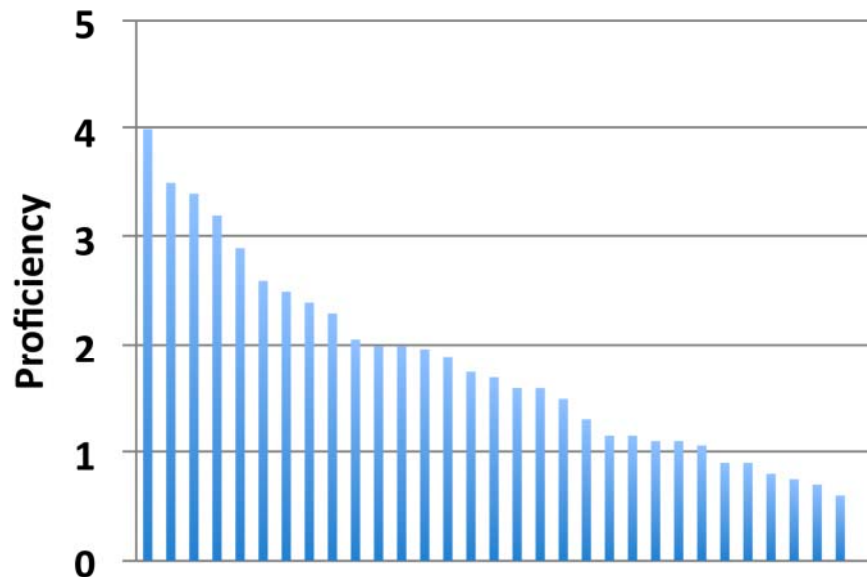
Average Student Proficiency Gain



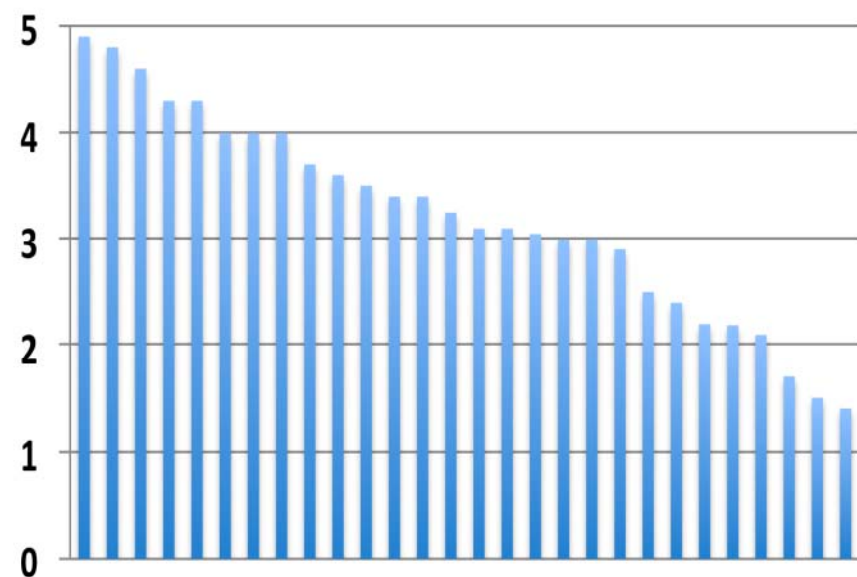
Participants went from READY to CAPABLE

VALUE PIL Distributions

Before VALUE PIL (Avg = 1.8)



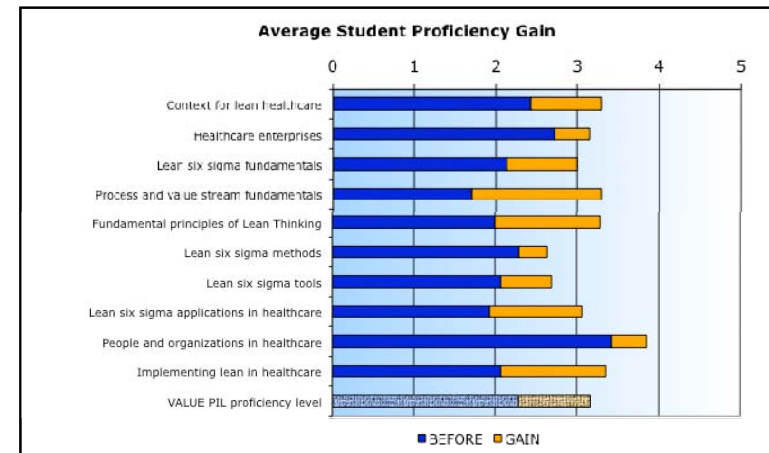
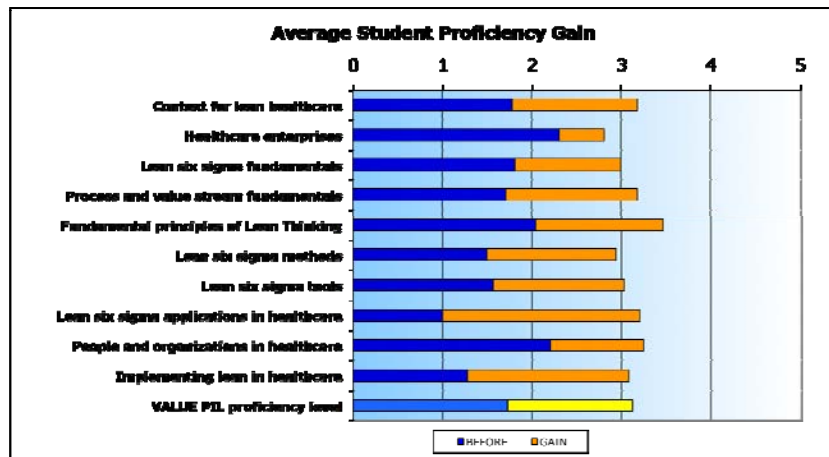
After VALUE PIL (Avg = 3.2)



Individual VALUE PIL proficiencies sorted from highest to lowest. Everyone improved!

Other 2009- 2010 Deployments

- Offered through MIT's summer CE program
- Enrollment insufficient to support full sim
- Combined with traditional LAI Lean Academy



- We learned a combined class was feasible
- Needed to be re-architected for synergistic fit

Course Revision

Version 2 of course has been developed & tested

- Less emphasis on people & organization topics
- Less emphasis on safety tools
- More emphasis on A3 Thinking and Tool
- More emphasis on Six Sigma Basics
- Designed to fit together with LAI Lean Academy for greater deployment flexibility
 - Meet together 50% of time – mostly fundamentals
 - Meet separately 50% for Lego simulation, six sigma basics implementation, people & organization
 - Includes plant tour

Tested on MIT students in January 2011

- Revisions worked well

Day 1

Fundamentals

- The Start of Your Lean Journey, 6S
- Lean Thinking: Process, 5 Lean Fundamentals, Waste and Value, Value Stream Mapping, 5 Whys, Mistake Proofing, Genchi Genbutsu, ...
- Plant tour



Day 2

Lego Clinic Simulation

- Application of Day 1 fundamentals, plus
- Structured PDSA problem solving framework involving A3 thinking and root cause analysis
- RPIW
- DMS



Day 3

Advanced Topics

- Accounts payable case study
- Variation & Six Sigma basics
- High Performance Healthcare
- Implementation
- Enterprise Speaker



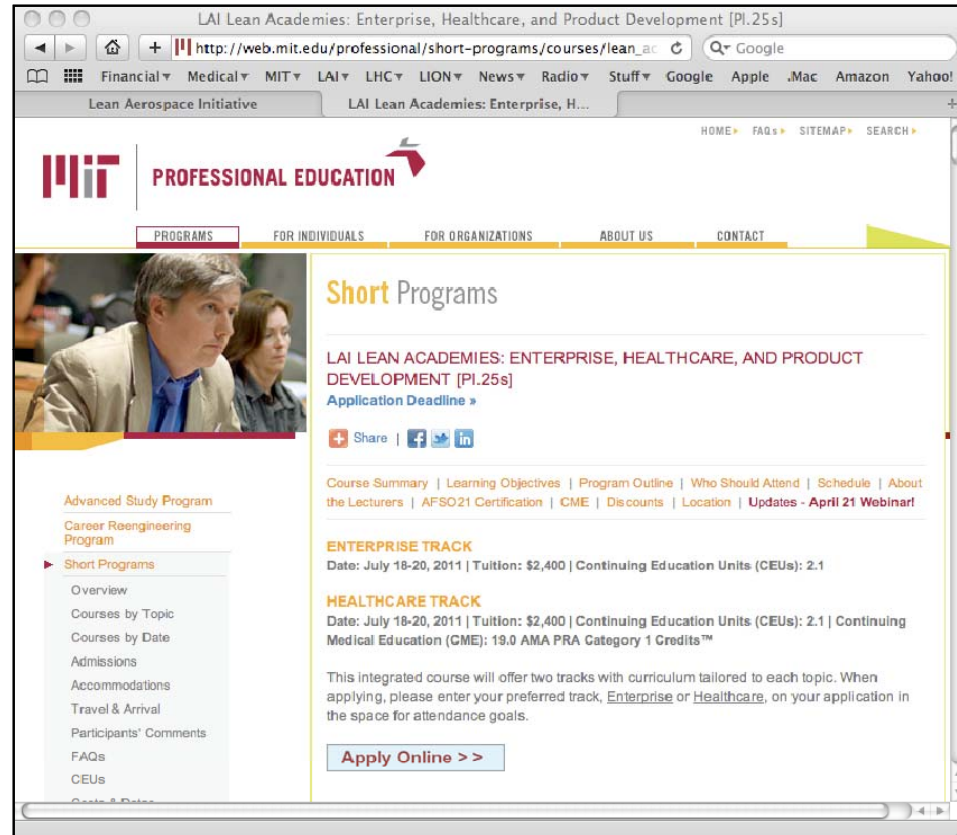
Upcoming Offerings

MIT's Professional Education Program

- July 19 – 21 Open enrollment
- Update of version tested in January

1 day introductory course - NEW

- June 9 to VA Fellows
- Clinic simulation and lean fundamentals



The screenshot shows a web browser window displaying the MIT Professional Education website. The page title is "LAI Lean Academies: Enterprise, Healthcare, and Product Development [P1.25s]". The URL in the address bar is "http://web.mit.edu/professional/short-programs/courses/lean_ac". The page features the MIT logo and navigation tabs for "PROGRAMS", "FOR INDIVIDUALS", "FOR ORGANIZATIONS", "ABOUT US", and "CONTACT". The main content area is titled "Short Programs" and highlights the "LAI LEAN ACADEMIES: ENTERPRISE, HEALTHCARE, AND PRODUCT DEVELOPMENT [P1.25s]" course. It includes an "Application Deadline" link, social media sharing options, and a list of links for "Course Summary", "Learning Objectives", "Program Outline", "Who Should Attend", "Schedule", "About the Lecturers", "AFSO21 Certification", "CME", "Discounts", "Location", and "Updates - April 21 Webinar!". Two tracks are listed: "ENTERPRISE TRACK" (Date: July 18-20, 2011 | Tuition: \$2,400 | Continuing Education Units (CEUs): 2.1) and "HEALTHCARE TRACK" (Date: July 18-20, 2011 | Tuition: \$2,400 | Continuing Education Units (CEUs): 2.1 | Continuing Medical Education (CME): 19.0 AMA PRA Category 1 Credits™). A note states: "This integrated course will offer two tracks with curriculum tailored to each topic. When applying, please enter your preferred track, Enterprise or Healthcare, on your application in the space for attendance goals." An "Apply Online >>" button is visible at the bottom of the course description.

<http://web.mit.edu/professional/short-programs/>

Select: Courses by Topic
Select: Lean Enterprise



Questions and Discussion

Summertime Enterprise Thinking

June 9-10, 2011

**Epoch-Based Thinking:
Anticipating System
and Enterprise
Strategies for
Dynamic Futures**

Donna Rhodes, Ph.D.
Adam Ross, Ph.D.



June 6-8, 2011

**Value-Driven
Tradespace
Exploration for
System Design
Future Enterprise**

Donna Rhodes, Ph.D.
Adam Ross, Ph.D.



June 13-14, 2011

**Architecting
the Future
Enterprise**

Prof. Debbie Nightingale
Donna Rhodes, Ph.D.



June 20-21, 2011

**Principles of
Enterprise
Transformation**

Prof. Debbie Nightingale
Jayakanth Srinivasan, Ph.D.

New Course



July 18-20 or July 18-22, 2011

**LAI Lean Academies:
Enterprise, Healthcare, and
Product Development**

Enterprise Track
July 18-20

Healthcare Track
July 18-20

PD Track
July 21-22

Eric Dickson, M.D.
Hugh McManus, Ph.D.
Prof. EarlI Murman

Eric Rebentisch, Ph.D.
Julie Vannerson, M.D.
Prof. Annalisa Weigel



Audience Feedback

Overall, this session

A. Exceeded

B. Met

C. Fell short

of my expectations

Submit your answer to the online poll

Thank you!

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