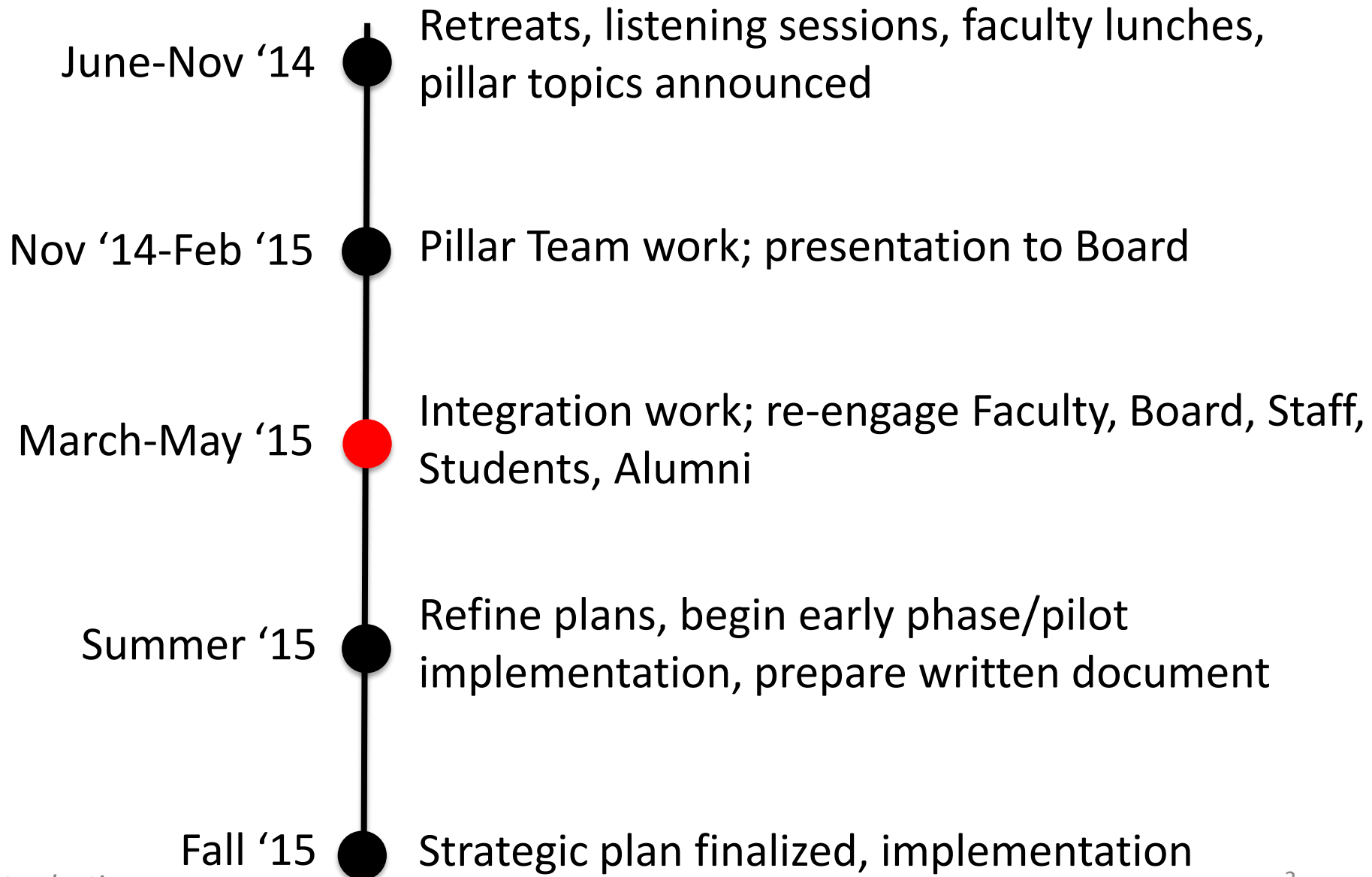# Elevating WPI's Impact and Value: Ideas from Strategic Planning

Laurie Leshin, President

Presentation to WPI Community

April 13, 2015

Overall Strategic Planning Timeline/Process

June-Nov '14	●	Retreats, listening sessions, faculty lunches, pillar topics announced
Nov '14-Feb '15	●	Pillar Team work; presentation to Board
March-May '15	🔴	Integration work; re-engage Faculty, Board, Staff, Students, Alumni
Summer '15	●	Refine plans, begin early phase/pilot implementation, prepare written document
Fall '15	●	Strategic plan finalized, implementation

Introduction

Reminders

- "Pillars" for initial set of discussions derived through significant engagement, especially with faculty and trustees

- Balance challenge 1: Plan is both big enough and right-sized for action over the next 3-5 years

- Balance challenge 2: Teams and process are both inclusive and manageable:
  - >90 total team members
  - 58 hold academic appointments
  - 37 "non-administrative" faculty
  - 21 currently a part of Faculty Governance
  - 4 Trustees

Pillar Team Participants: THANK YOU!

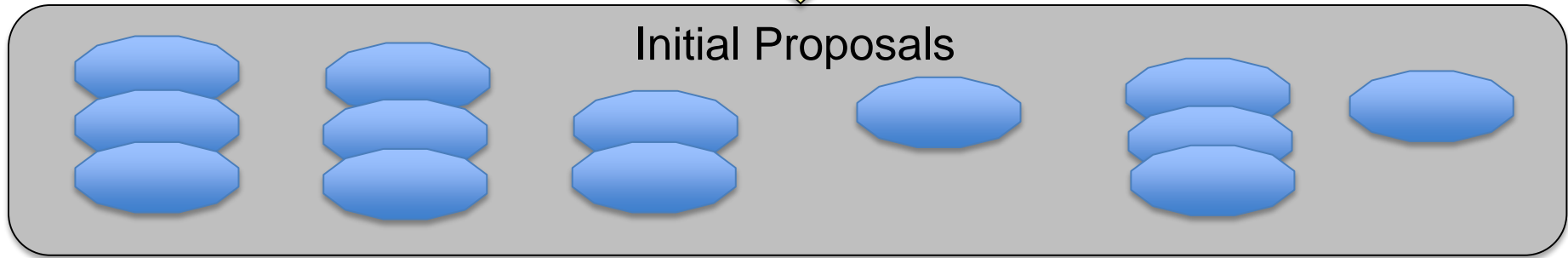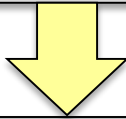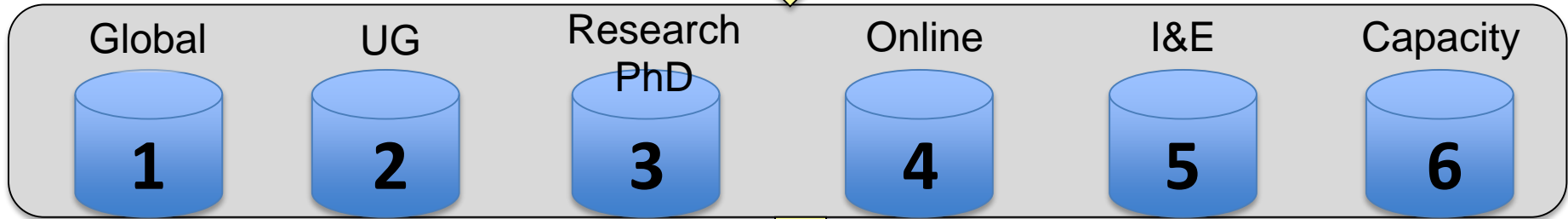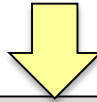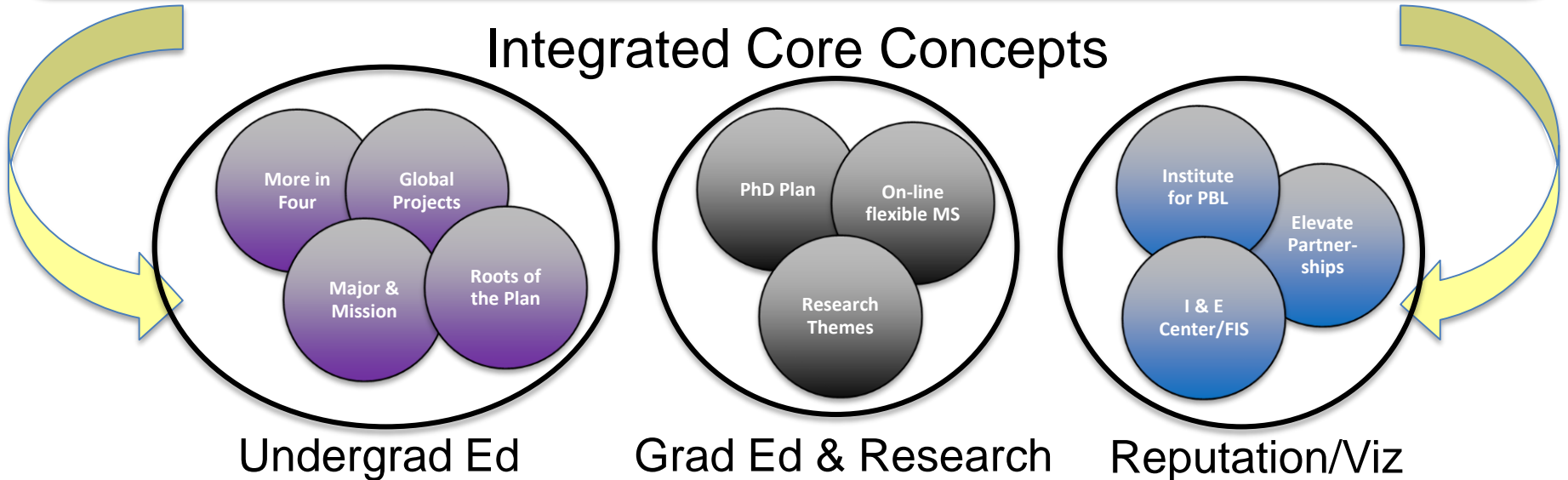|				
Jo-Ann Alessandrini	Tanja Dominko	Frank Hoy	Michael McGrade	David Spanagel
Diran Apelian	James Doyle	Germano Iannacchione	Melissa Mobley	Diane Strong
Mike Aspinwall	Jim Duckworth	Hajar Jafferji	Amy Morton	John Sullivan
Jon Bartelson	Joe Duffy	Scott Jiusto	Karen Oates	Kris Sullivan
Jim Baum	Tahar El-Korchi	Bob Kinicki	Anne Ogilvie	Steve Taylor
Karen Bean	Greg Fischer	Steve Kmiotek	Eric Overström	Kristin Tichenor
Joseph Beck	Stephen Flavin	Steve Koppi	Taskin Padir	Judi Trainor
Kris Billiar	Tom Gannon	Rob Krueger	Stephanie Pasha	Rick Vaz
Kristin Boudreau	Nikolaos Gatsonis	Susan Landau	George Pins	Bogdan Vernescu
Nancy Burnham	Glenn Gaudette	Rachel LeBlanc	Reeta Prusty Rao	Craig Wills
Terri Camesano	Mike Gennert	Cindy Lindberg	Mark Rice	Kris Wobbe
Luca Capogna	Arne Gericke	Rob Lindeman	Mark Richman	Sharon Wulf
Philip Clay	Karen Goudey	Eleanor Loiacano	Jennifer Rudolph	Alex Wyglinski
Jen Cluett	Peter Hansen	Francesca Maltese	Elke Rundensteiner	Jamal Yagoobi
Dave Cyganski	Dana Harmon	Tony Mangano	Liz Ryder	Amy Zeng
Maureen Deiana	Mary Beth Harrity	VJ Manzo	Deborah Scott	
Chrys Demetry	Tracy Hassett	Bob Martin	Craig Shue	
Dave DiBiasio	George Heineman	Yehia Massoud	Greg Snoddy	
Fred DiMauro	Art Heinricher	Bill McAvoy	Jeff Solomon	

Strategic Planning Pillars

1. Expand **Global** Reach and Impact

2. Elevate **Distinctive Undergraduate Programs** to New Levels of Excellence and Value

3. Strengthen **Research Enterprise and PhD Programs**

4. Create Innovative **Online Graduate & Continuing Education Programs**

5. Build an Engine of **Innovation & Entrepreneurship**

6. Enhance our **Capacity** to Deliver on the WPI promise

Today you'll see a high level <u>integrated summary</u> including some highlights from individual pillar presentations, and ideas about <u>next steps</u> (not detailed implementation plans)

Retreats, Listening Sessions

Global 1 UG 2 Research PhD 3 Online 4 I&E 5 Capacity 6

Initial Proposals

Integrated Core Concepts

More in Four Global Projects Major & Mission Roots of the Plan

Undergrad Ed

PhD Plan On-line flexible MS Research Themes
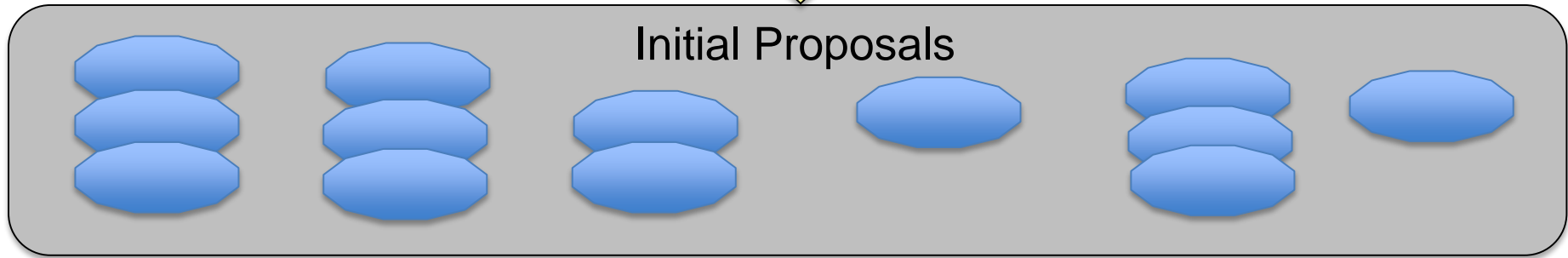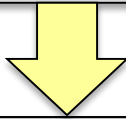
Grad Ed & Research

Institute for PBL Elevate Partner-ships I & E Center/FIS

Reputation/Viz

Retreats, Listening Sessions

Global 1
UG 2
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Undergrad Ed

Grad Ed & Research

Reputation/Viz

✓ Double-down on <u>Distinctive Undergraduate Education:</u>

- Expand the quantity and impact of <u>Global Projects</u>

- <u>Major and a Mission</u>: Create more intentionality, mindset (global, entrepreneurial), integration in work beyond the major

- Focus on increased value for students and families, doing <u>More in Four</u>

- Return to the <u>Roots of the WPI Plan</u> through flexible, student-centric education

Setting the Stage: Courses and Projects

38 Required Courses
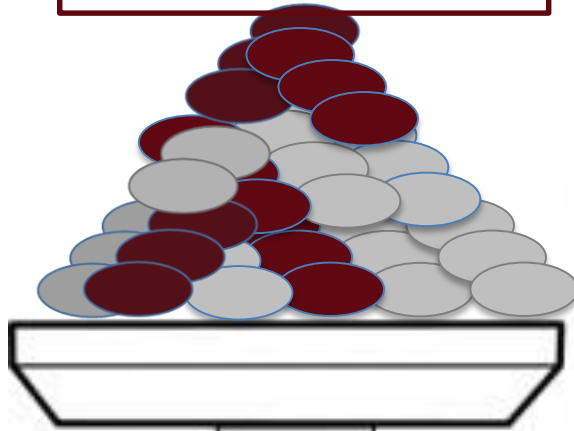
3 Required Projects

Inquiry

IQP

MQP
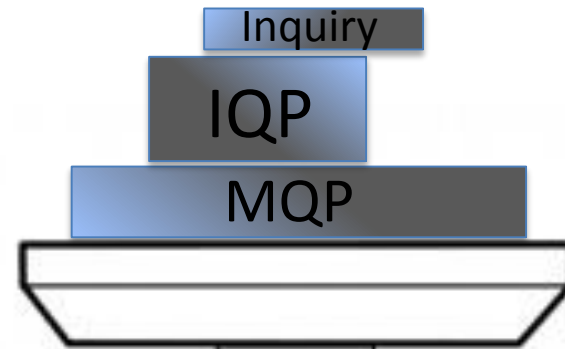
Opportunities:
- Increase flexibility/personalize
- Leverage technology
- Infuse additional competencies
- Enable acceleration

Opportunities:
- More off campus
- Increase connection
- Deeper reflection
- Greater impact

Undergraduate Education

Global Projects

Expand number and document impact of global projects
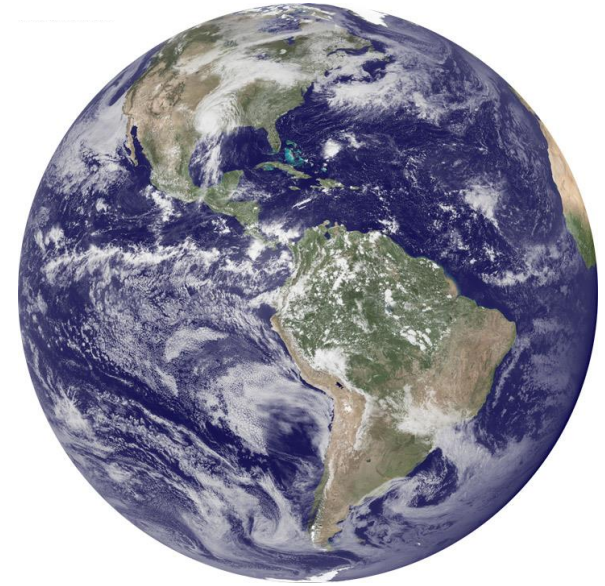
- Reduce barriers to participation in off-campus projects with a goal to increase participation to over 90%

- Demonstrate and elevate the impact of our projects on the communities they serve

- Connect to broader global competency

Major and a Mission:

Enable students to find and pursue passion/interests and enhance capacity to translate

theory → practice → impact

By contextualizing coursework and other activities

Example focus areas:

- <u>Grand Challenge</u> Scholars

- <u>Entrepreneurial</u> Mindset

- <u>Global</u> Competency

PASSION IS THE genesis OF GENIUS
– Galileo

I & E @ WPI: Focus on Impact

Through curricular & co-curricular opportunities:

- Instill <u>courage, confidence and curiosity</u> in students

- Cultivate inquisitive minds that pursue <u>innovative ideas</u> with tangible impacts

- Help students identify, assess and execute on the <u>best opportunities</u>

- Learn how to <u>bring impactful solutions</u> to individuals, communities and markets

More in Four:

Lower the cost of a WPI education to students & families

- Leverage AP credit

- Create paths to accelerated (4 year!) Masters degree

- Increase use of summer: On campus, on-line, & projects

- Opportunities for Professional Practicum (w/earnings)

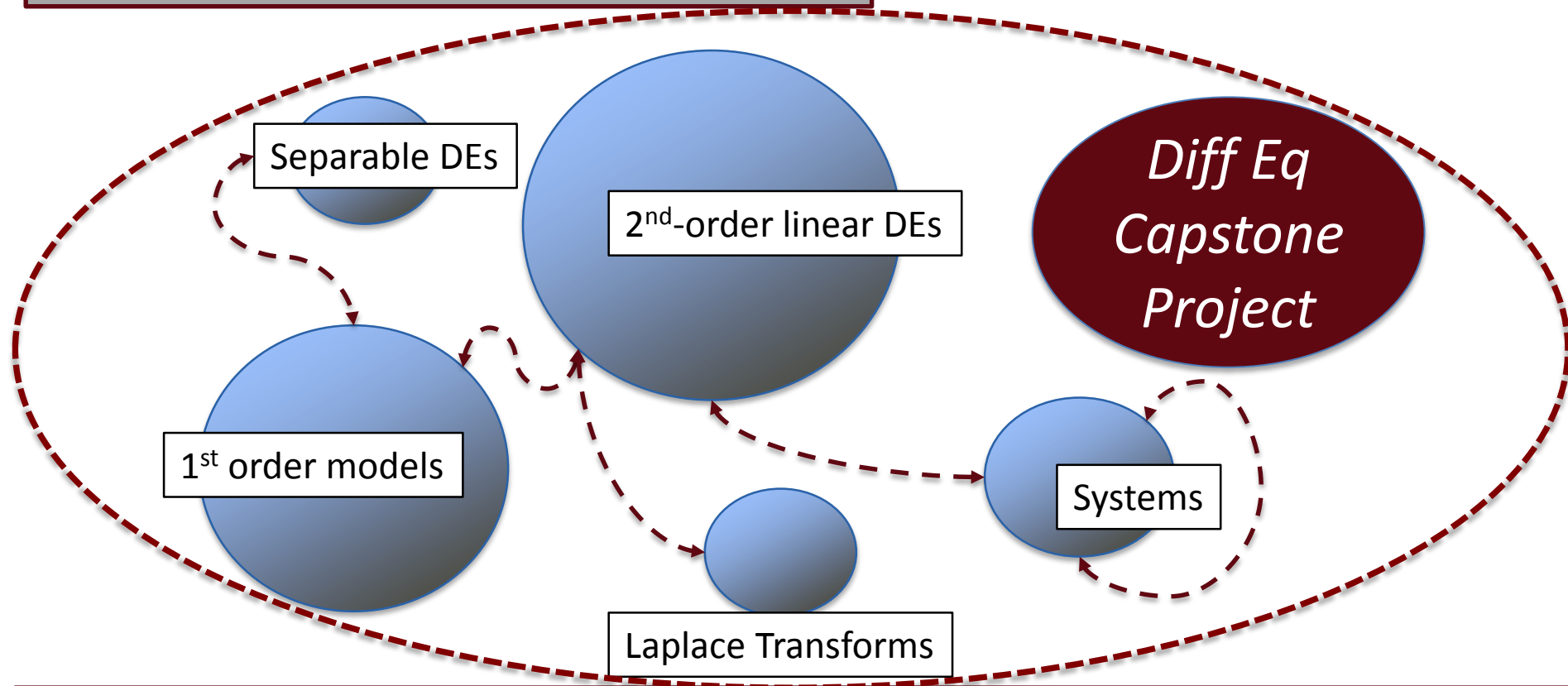# Roots of the Plan:

√ *The Plan*

> Focus on competency and leverage technology to increase the flexibility, efficiency, and impact of the undergraduate program.

- Leverage additional flexibility created <u>to maximize deep, integrated learning</u> through time spent in groups, in classrooms, and with faculty

- Could be especially powerful in the <u>first year</u>

Roots of the Plan:

√ *The Plan*

Identify the Key Ideas and Skills:

Separable DEs

2nd-order linear DEs

Diff Eq Capstone Project
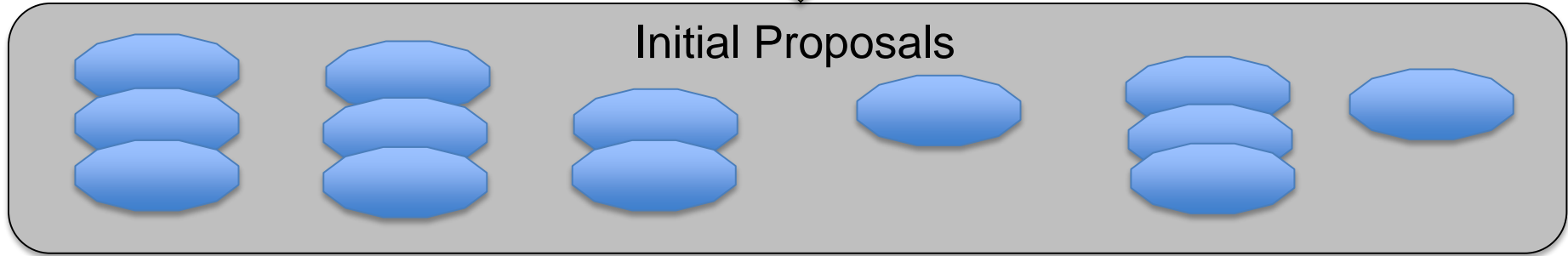
1st order models

Systems

Laplace Transforms

Require mastery of all, but not necessarily on the same 7-week schedule; Personalize the path and support

Undergraduate Education

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Undergraduate Education: Next Steps

- Conceptualize and begin to offer some "Major and a Mission" options: entrepreneurial mindset, global competency, and 1-2 grand challenges (e.g. energy, security, global health)

- Develop and publicize options for More in Four

- Expand summer offerings (especially IQP's) and off-campus project options

- Pick two introductory undergrad classes to pilot for a group of students in the fully-flipped, competency-based approach

Undergraduate Education

Retreats, Listening Sessions

Global	UG	Research PhD	Online	I&E	Capacity
1	2	3	4	5	6

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PhD Plan
On-line flexible MS
Research Themes

Institute for PBL
Elevate Partnerships
I & E Center/FIS

Undergrad Ed

Grad Ed & Research

Reputation/Viz
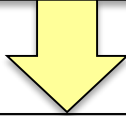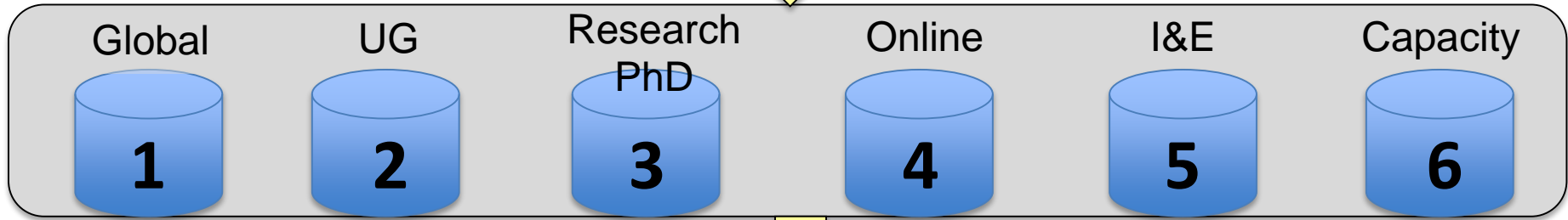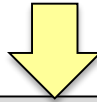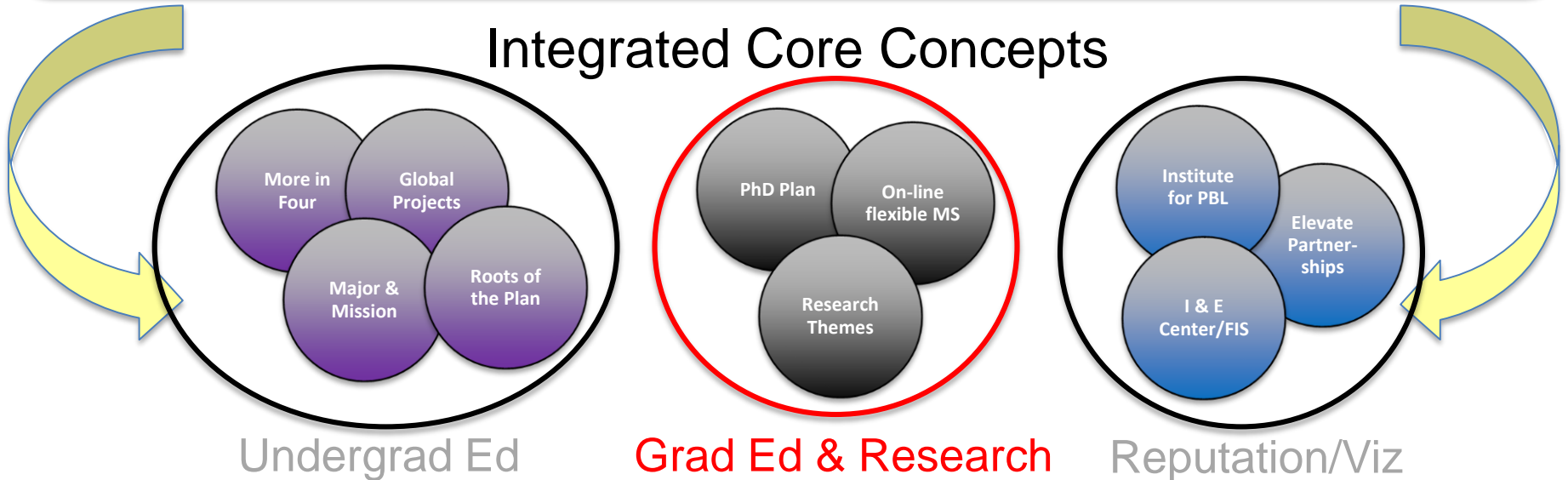
✓ Elevate Graduate Education and Research

- Enable critically <u>important research</u> where we can have impact

- Implement a <u>WPI PhD Plan</u> to elevate PhD programs

- Pilot a new, highly <u>flexible</u> approach to <u>online</u> MS education (with ripple effects in UG curriculum, too)

Broad Research Themes build upon strength & opportunity:

- **Health & Biotechnology**

- **Robotics & Cyberphysical Systems**

- **Advanced (Sustainable?) Materials, Manufacturing & Mobility**

- **Cyber, Data & Security Science & Engineering**

- **Learning Sciences & Technology**

IMAGINE A WORLD

Untethered healthcare

Medical devices
Imaging
Surgical systems

Wearable sensors

Home care
Rehab
Sensors & apps

Neuroprosthetics
Biomaterials
Regenerative Medicine

HEALTH & BIOTECHNOLOGY

WPI

Infection & disease
Neurodegenerative disease

Graduate Education & Research

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Health and Biotechnology

HHS Initiatives and Priorities (2015)

US Strategic Priority

- 2013 healthcare expenditures: $2.9 Trillion
- Coverage expansion & aging population drive faster growth in health spending
- Age 65+: 13% of population, 34% of spending
- Increased antibiotic resistance; call for "precision medicine" disease response

Advancing Scientific Knowledge and Innovation
- Promote Global Health Security
- Combat Antibiotic Resistance
- Protect from Healthcare-Associated Infections
- Advance Biomedical Research
- BRAIN Initiative
- Big Data
- Improve Healthcare via Health IT

Health:
Translational Biomedical
Science, Systems, and Engineering

Delivery of Care

Assistive Technologies

Interventional Technologies

Systems & Data

Biomanufacturing & Biofabrication

Biomaterials

Regenerative Medicine

Neuroprosthetics

Foundation of Disease

Infection & Disease

Neurodegenerative Disease

Cancer

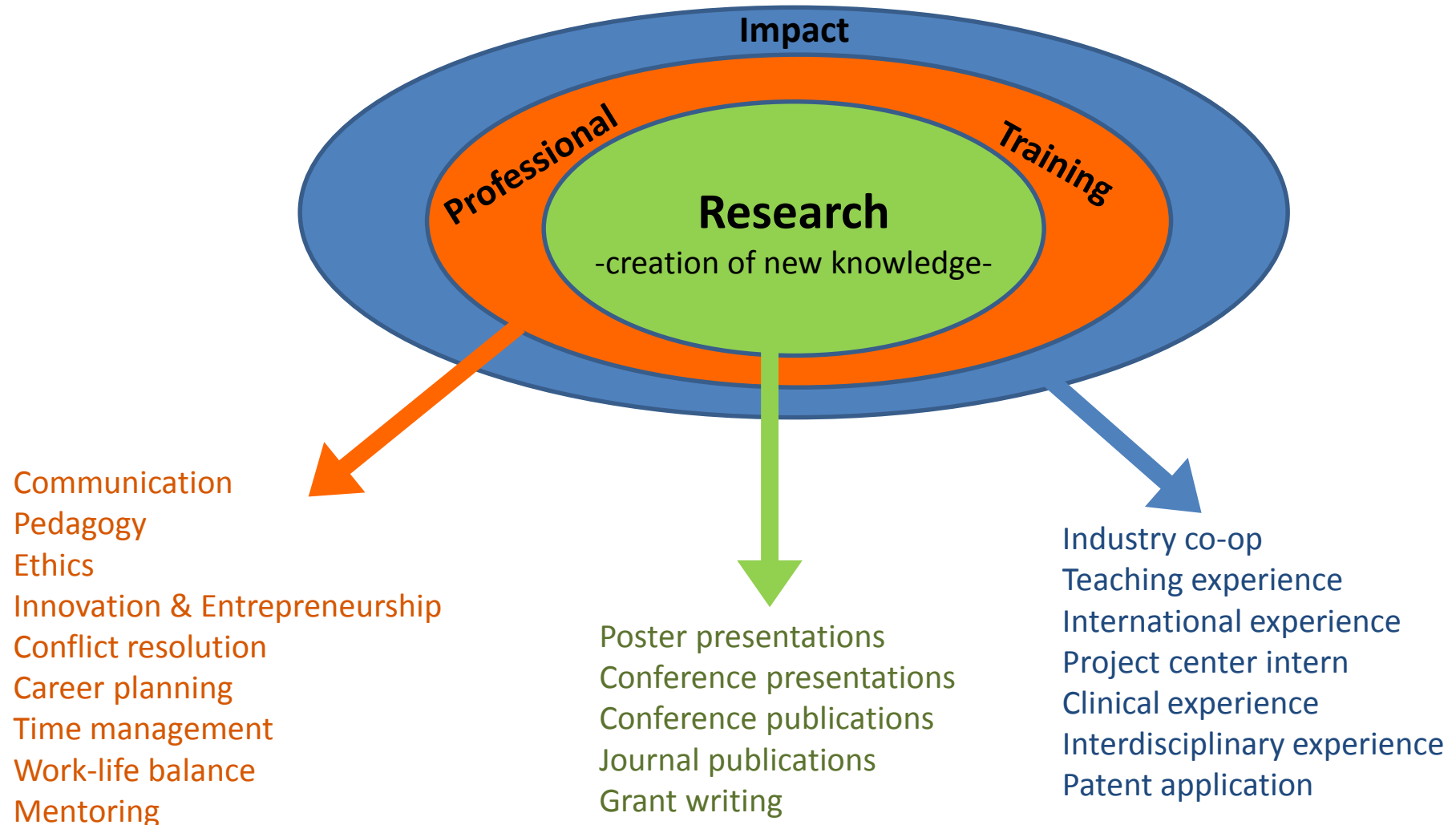**Cross-cutting themes:** *Improving Patient-specific Health, Improving Global Healthcare*

Technologies: *Robotics and automation; Biosensing technology; Cyber-physical systems; Wireless & security; Apps; Biofabrication; Systems dynamics; Modeling of healthcare and biological systems; Bioinformatics, EHRs, Big data analytics*

Bioengineering Institute, Healthcare Delivery Institute, Biomanufacturing E & T Center

The WPI PhD Plan: Conceptual Model

Impact

Professional

Training

Research
-creation of new knowledge-

Communication
Pedagogy
Ethics
Innovation & Entrepreneurship
Conflict resolution
Career planning
Time management
Work-life balance
Mentoring

Poster presentations
Conference presentations
Conference publications
Journal publications
Grant writing

Industry co-op
Teaching experience
International experience
Project center intern
Clinical experience
Interdisciplinary experience
Patent application

Pilot a highly flexible approach to online ed

- <u>27%</u> of our graduate credit hours are <u>delivered online</u> or blended

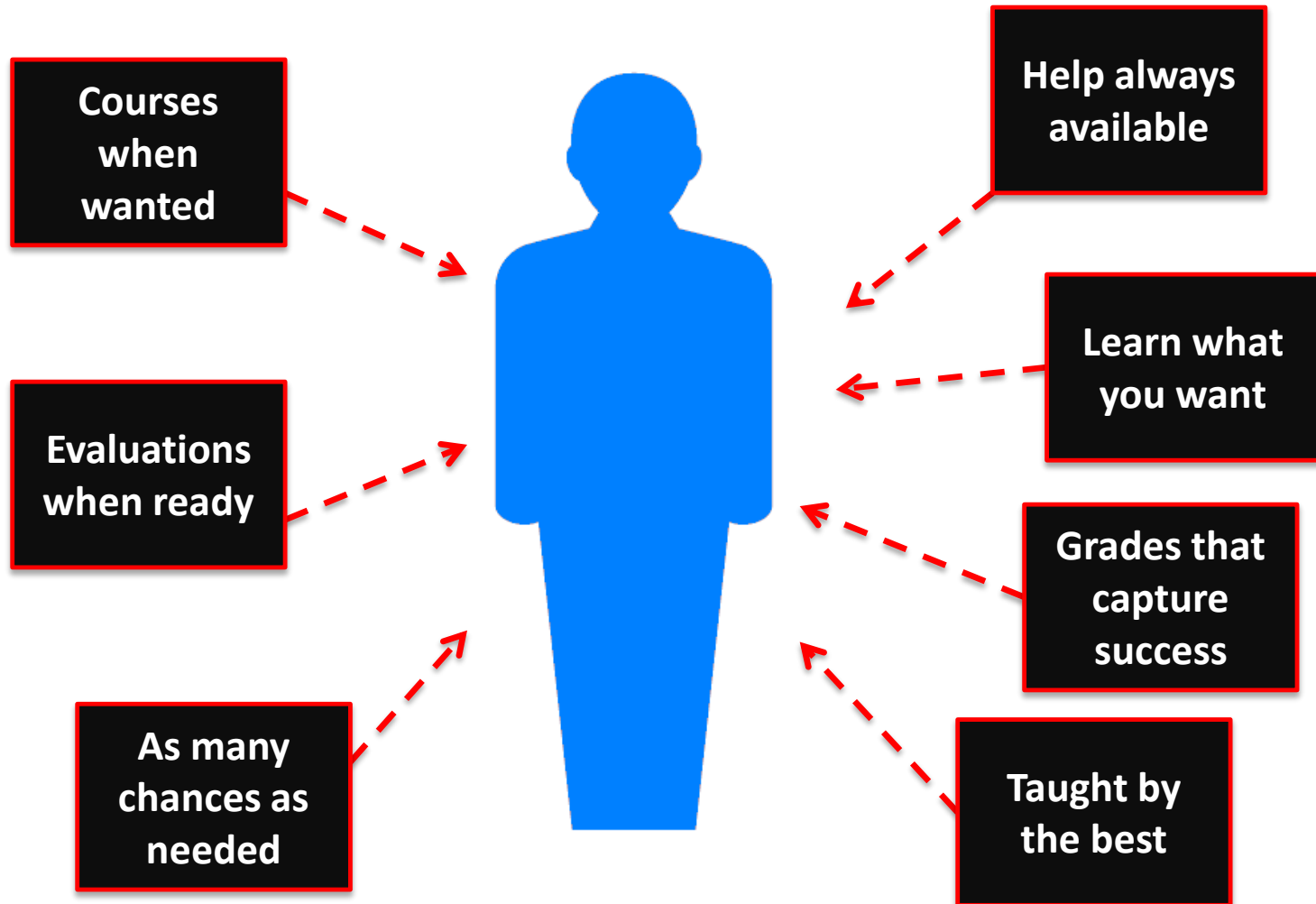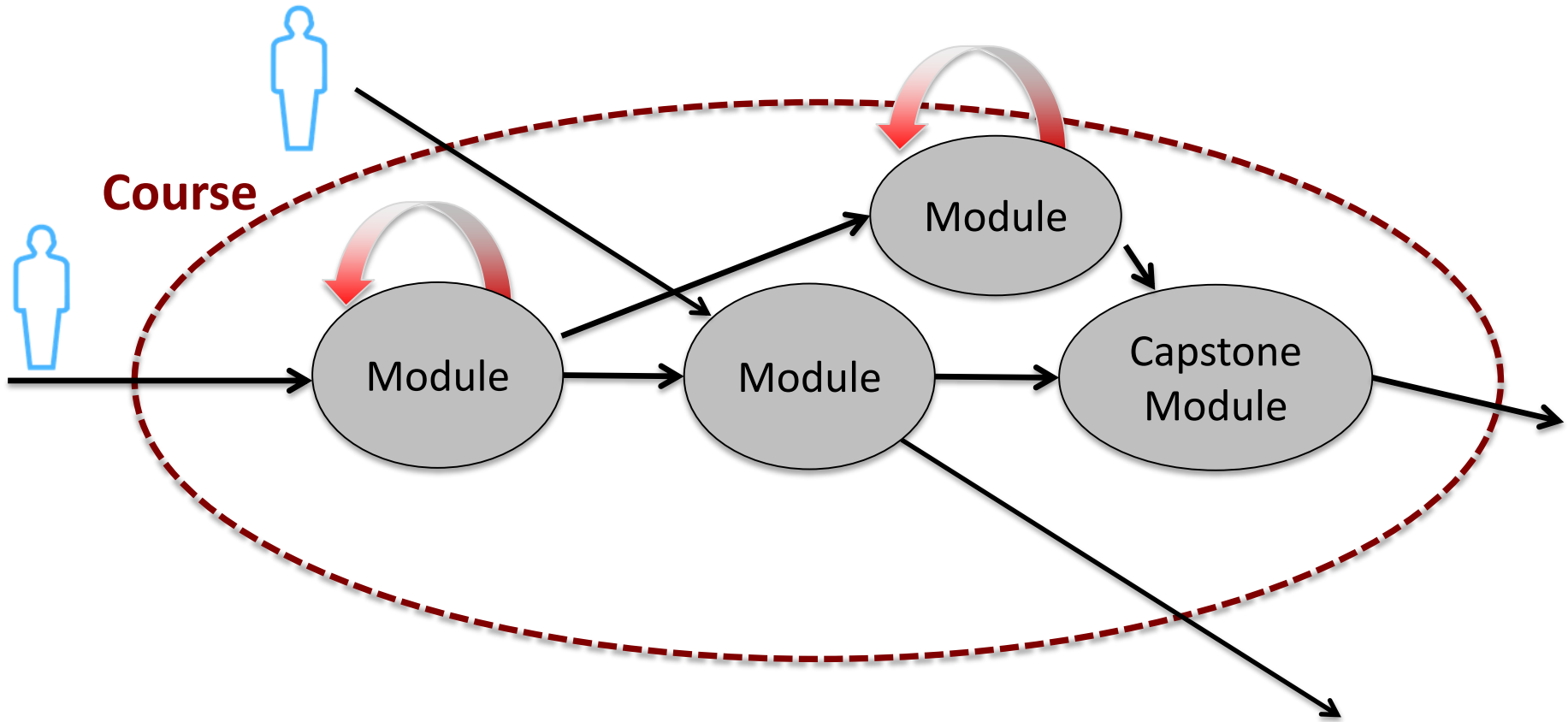- Apply the values of the WPI Plan (student-centric, flexible) to <u>create innovative online approach</u> to graduate degree, certificate, etc.

- Dovetails well with the "<u>roots of the plan</u>" ideas

- Proposal most <u>disruptive to current paradigm</u> (teaching assignments, financial model, technology needs) and so needs deep thinking/planning
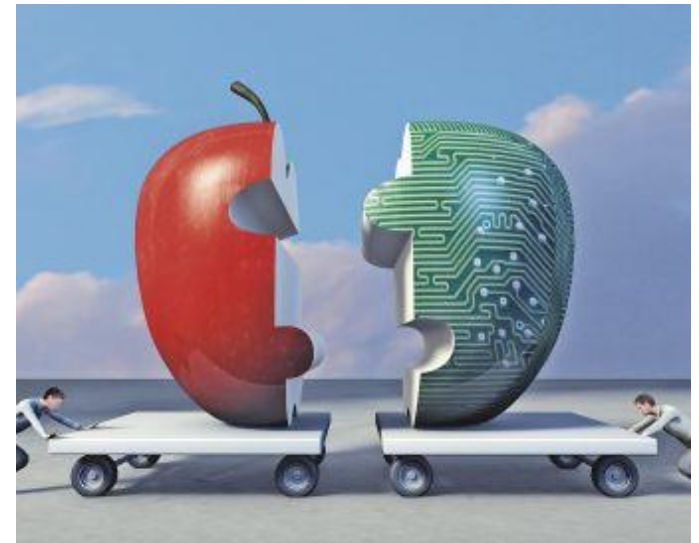
Student Centric Paradigm

Courses when wanted

Evaluations when ready

As many chances as needed

Help always available

Learn what you want

Grades that capture success

Taught by the best

Competency-based & Gamified

Course

Module → Module → Capstone Module

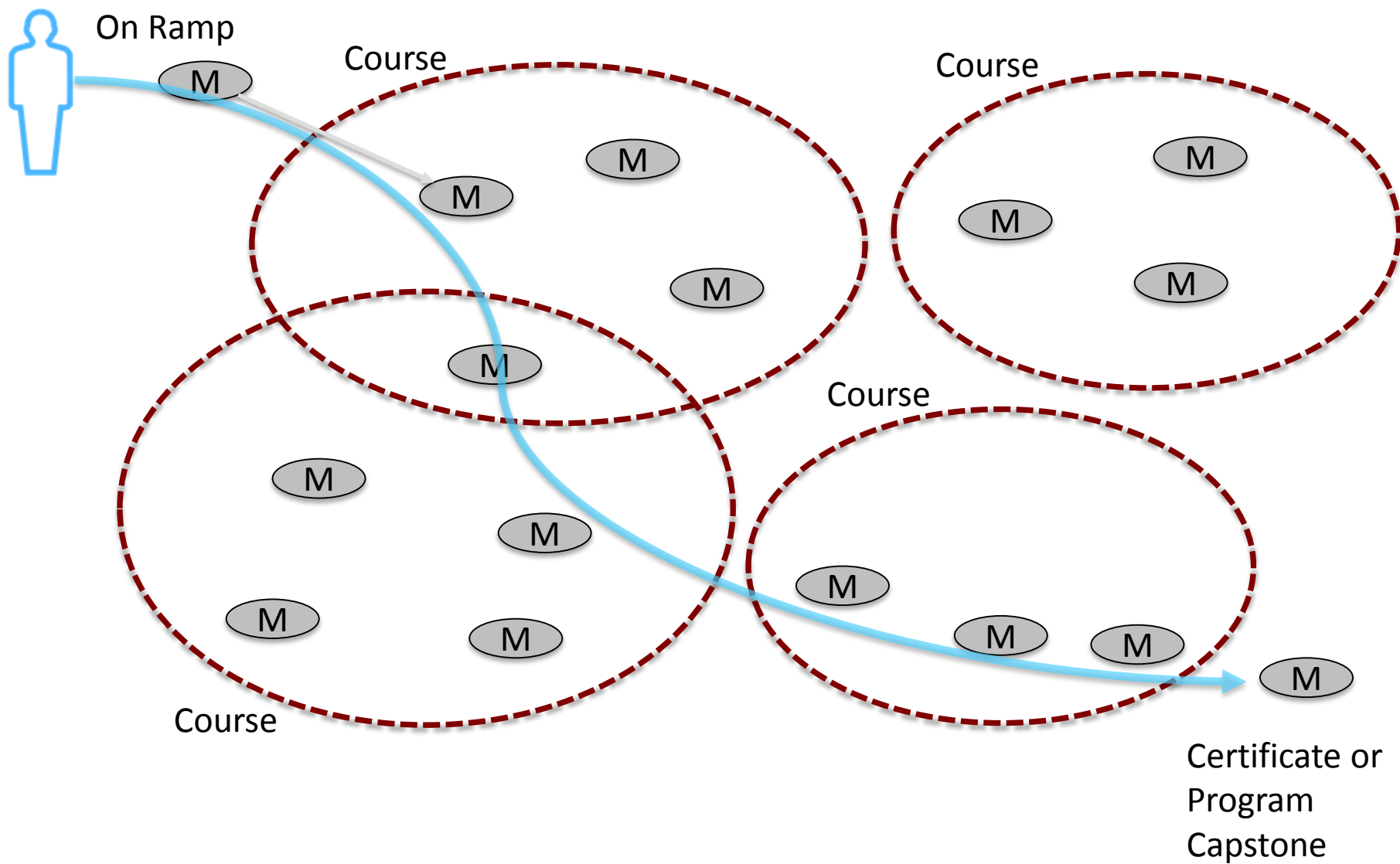Module

- Modules are stand-alone topical units with an evaluation
- Capstone modules can integrate several modules
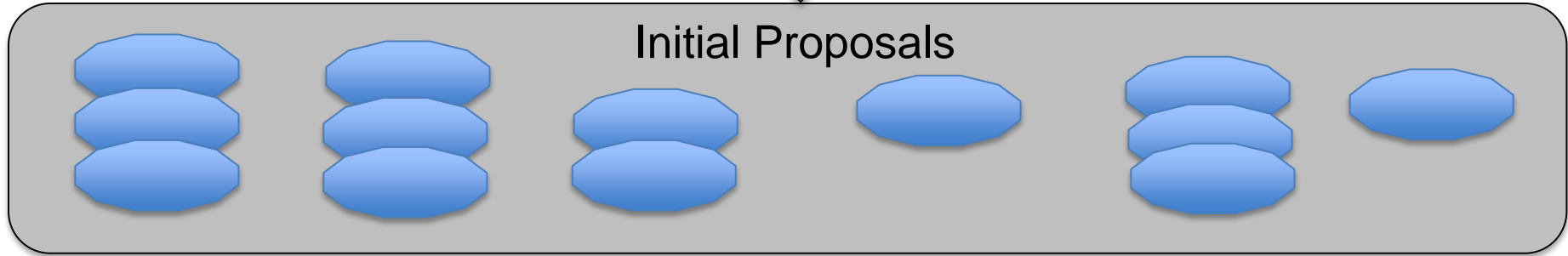- Any module may be reviewed and evaluation retaken at any time

Optimizes Student Flexibility and Efficiency

On Ramp

Course

Course

Course

Course

M

Certificate or Program Capstone

Graduate Ed & Research: Next Steps

- Develop initial <u>focus areas within research themes</u>

- Plan to develop & strengthen <u>Centers and Institutes</u>

- <u>Reinvest research income</u> strategically into the research & PhD programs

- Recommend <u>cluster hiring</u> in theme areas

- Enable <u>self-organizing transdisciplinary research groups</u>

- Create integrative <u>PhD Plan Programs</u> beyond the thesis

- Fully develop plan for platform, financial model, faculty support model, etc for <u>new online approach</u>

- Choose one graduate level program for phased <u>online pilot</u>

Retreats, Listening Sessions

Global 1 | UG 2 | Research PhD 3 | Online 4 | I&E 5 | Capacity 6

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Undergrad Ed
- More in Four
- Global Projects
- Major & Mission
- Roots of the Plan

Grad Ed & Research
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- On-line flexible MS
- Research Themes
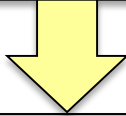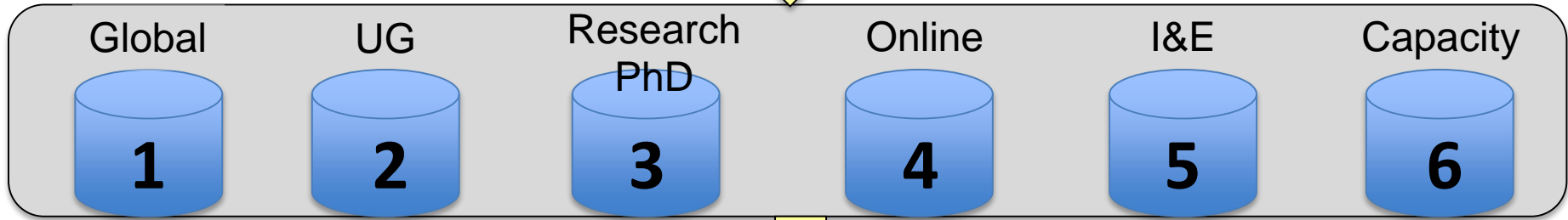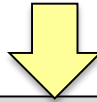
Reputation/Viz
- Institute for PBL
- Elevate Partnerships
- I & E Center/FIS
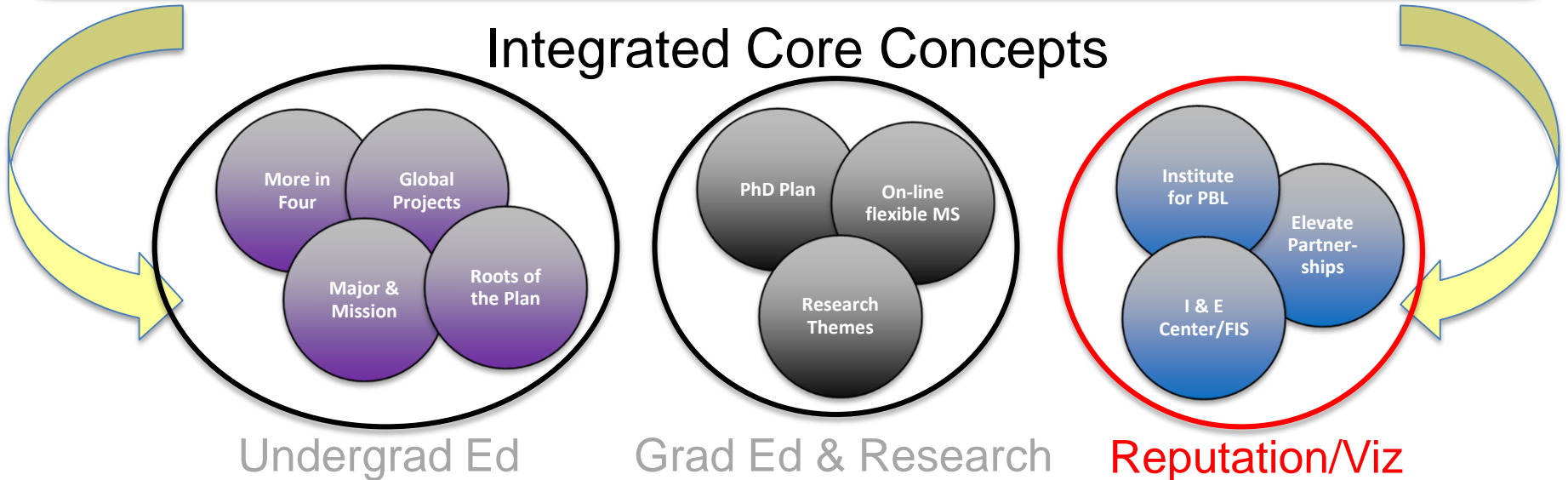
✓ Enhance WPI's Reputation and Visibility

- Claim <u>leadership</u> in project-based, globally-engaged education

- Be <u>more intentional, strategic and collaborative</u> in global endeavors and partnerships

- Leverage the new <u>Foisie Innovation Studio</u> to house and highlight our distinctive educational activities, including new ideas emerging from planning

Claim leadership in project-based, globally-engaged education: Institute for Project-Based Learning

Be more intentional, strategic and collaborative in global endeavors

Europe
- Alumni clusters throughout region
- 6 IQP centers
- 4 MQP centers
- 150 students traveling there next year
- Strong Academic Partnerships in 8 countries

Milan, Italy. Glenn Gaudette visits Politecnico di Milano for work on cell growth and tissue engineering.

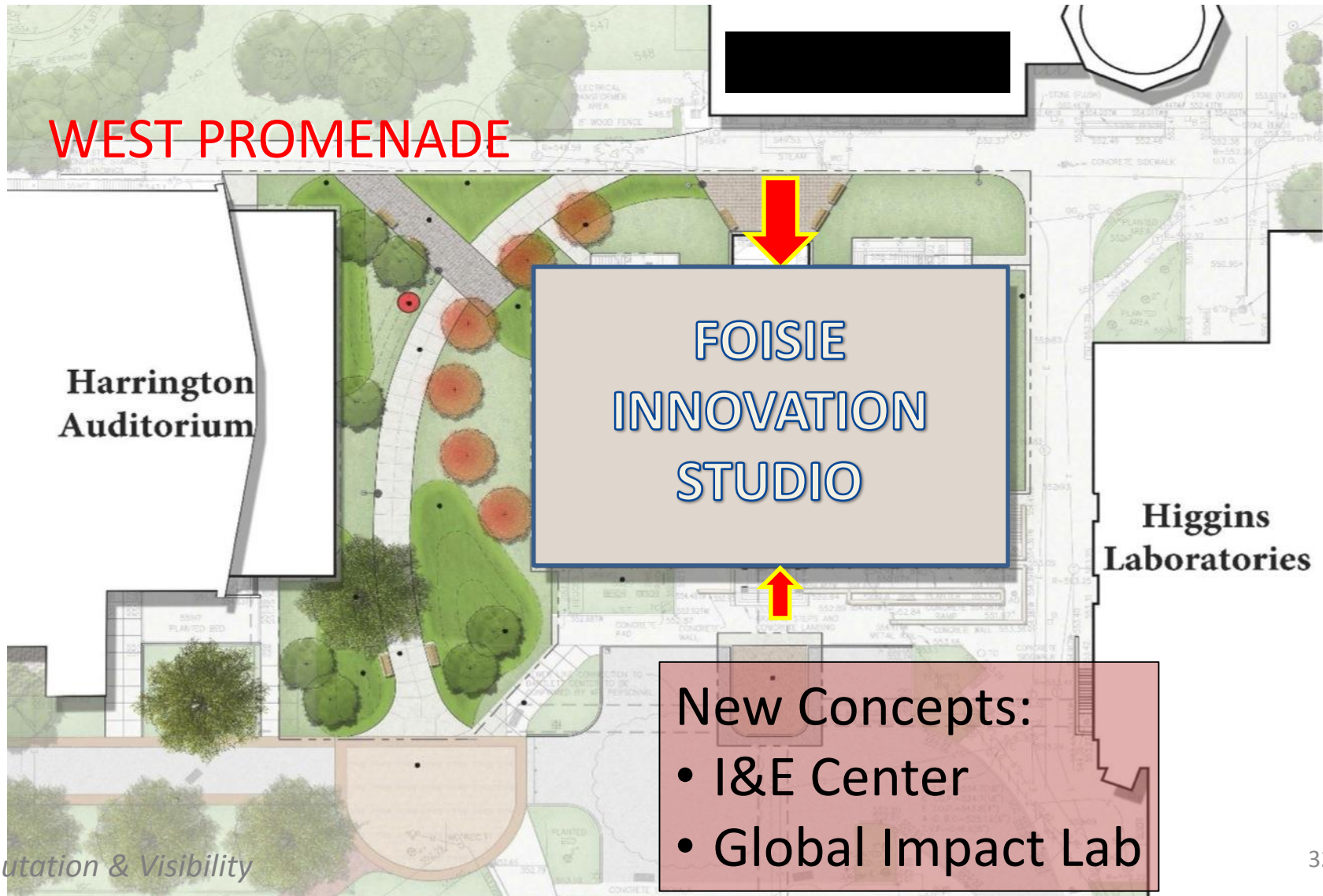*Panama City, Panama.* President Leshin visits the Panama Canal site where WPI students are conducting project work.

Worcester, MA. Students develop adaptive bicycles for people with disabilities.

Windhoek, Namibia. WPI students work with community members in a settlement outside of Windhoek, Namibia, to develop methods to address flooding and erosion during the rainy season.

Central America
- Strong and well-placed alumni base
- Unique opportunity through Panama Canal MQP center
- IQP center
- High-level strategic partners
- University partnership: Technological University of Panama

China
- Strong alumni base
- 4 Project centers
- 6 university partners
- 20 corporate partners
- Significant fundraising potential

Hangzhou, China. E-bike sharing project team with sponsor, Hangzhou Omnipay—and with HDU Liaison.

- **Project Centers**
- **Institutions/Universities**
- **Corporate Partners**
- **Alumni**
- **Major Prospects**

Reputation & Visibility

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Leverage the new Foisie Innovation Studio to highlight our distinctive educational activities

WEST PROMENADE

Harrington Auditorium

FOISIE INNOVATION STUDIO

Higgins Laboratories

New Concepts:
- I&E Center
- Global Impact Lab

Reputation and Visibility: Next Steps

- Plan and launch permanent Institute for Project Based Learning

- Appoint leads/teams and develop strategies for targeted geographic areas

- Flesh out operating concepts and early activities for I&E Center and Global Impact Lab

Next Steps for April Engagement

- Provide initial impressions today
- Let the ideas settle a bit and then attend a "Strategy Cafe" at the Goat's Head for deeper conversations

For Faculty:

4/21, 2:00 – 3:30 PM: Undergraduate Ed

4/22, 3:00 – 4:30 PM: Graduate Ed & Research

4/29, 9:00 – 10:30 AM: Visibility/Reputation

For All:

4/24, 1:00 – 2:30 PM: Undergraduate Ed
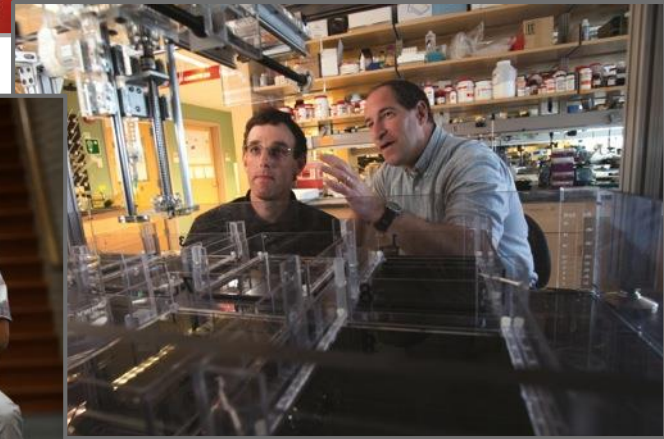
4/24, 3:00 – 4:30 PM: Graduate Ed & Research

4/30, 9:30 – 11:00 AM: Visibility/Reputation

Closing Thoughts

These ideas emerged from our community and I am thrilled to represent them

They are more driven by opportunity than threat: Our innovations are self-motivated

There is more work ahead, but we're on an exciting path to build upon WPI's tradition of innovation in higher education

Closing

THANK YOU!