



Launching and Leading Change in STEM

Judith Ramaley

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Introduction

Inese Berzina-Pitcher, ASCN Project Manager



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- You can submit questions and/or comments via the chat box in the lower right portion of the webinar screen.
- After the webinar, please fill out the brief survey to help us improve your experiences.
- Mark your calendars for our next webinar!

**Title: Individual Faculty Adoption and Participation in STEM Education Reform:
Moving from Constraint to Possibility**

Presenter: Cassandra Volpe Horii, Ph.D., President, POD Network in Higher Education

Date: Wednesday, January 17, 12:30 pm ET



About ASCN

What we do:

- Connect people and groups
- Curate resources
- Endorse ideas and resources

How to engage:

- Join our mailing list
- Become a member of one of the working groups
- Write a blog post
- Propose a webinar

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- Facebook: <https://www.facebook.com/ascnhighered>
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Judith Ramaley

Some highlights of her distinguished career:

- President Emerita and Distinguished Professor of Public Service at Portland State University in the Mark O. Hatfield School of Government.
- President Emerita of Winona State University.
- Former president of the University of Vermont.
- Visiting Senior Scientist at the National Academy of Sciences.
- Assistant Director, Education and Human Resources Directorate (EHR) at The National Science Foundation.
- Professor of biology.



Launching and Leading Change in STEM

Dr. Judith Ramaley



The Role of STEM in the Path Ahead (1)

1. What kinds of learning will be needed to navigate successfully in a **complex and interconnected world**?
2. What kinds of learning will prepare our graduates for an economy in which **innovation** is a constant?
3. How should we prepare **citizens** who will take responsibility for their own actions as well as for doing their part to promote quality of life in their communities, who can **think both locally and globally** and act accordingly?

The Role of STEM in the Path Ahead (2)

4. How can we provide **an excellent education** for all of our students and **pathways** to help them be successful?

5. How will we successfully work through generational transitions and learn to **work together across generations**?

6. How can we **work with others** in our communities to address the issues that are shaping our future?



To travel this path, we all have to change our ways!

- How we educate and what we expect of our graduates
- How we learn together and work together (a campus as a community of learners)
- Who we educate (growing diversity and income disparities) and what they seek from their experiences
- How we interact with the many communities we serve, including campuses with which we share students simultaneously or in sequence
- How we work with our academic colleagues both within our departments and across disciplines



To travel this path, our ways ARE changing!

- How knowledge is produced, vetted and put to use and who does each of these tasks, including the role of our students.
- How we communicate with each other (via technology and in person)
- Who we are and what we value(transitions in the Academy)
- What society wants from us (legislative mandates, public opinion, goals of our students, needs of employers)
- How STEM fits into the overall curriculum for all students.

What other changes are in store?

- New approaches to faculty roles and careers
- New approaches to the curriculum, to supporting learning and to the student experience
- Different approaches to assessing learning
- Greater capacity for integration, coherence
- Support structures and technical assistance
- Community partnerships of various kinds
- New forms of accountability and analysis of impact: social returns, economic returns

What are you setting out to do?

- STEM education project on a national scale?
- Role of STEM in general education?
- Changes in the overall undergraduate curriculum—guided pathways or interdisciplinary approaches to STEM, for example?
- Changes within a single college?
- Changes within a single department or course by course?

What role are you playing in your change effort?

- Senior Administrator providing encouragement and support
- Project lead/chair of the project team
- Member of a team undertaking changes in STEM education
- A community partner
- A funder of a STEM education project
- Other?

Where are you in the project?

- In the proposal stage
 - Still working on the design and expected outcomes of your proposal
 - Seeking support on campus or from a system office
 - Seeking external funding
- Getting ready to launch the effort
- Have recently launched the project
- Pretty far along and starting to see results/impact

A Toolkit for responding to a changing environment and new mandates

- Living in a complex system
- Design thinking as a way of creating new strategies and solutions
- Systems thinking applied to academic culture
- Mapping out an approach to change within a complex system

Working in a Complex System

- In a complex system---
 - Small changes cascade through the system in unexpected ways with unintended consequences
 - Feedback occurs throughout the system leading to unpredictable reactions and outcomes
 - The initial state of the system matters and shapes the response to any new stimulus.
 - Our campuses are not stable and self-contained systems. They are increasingly open to the external environment.
 - Source: Samuel Arbesman (2016) *Overcomplicated*. p. 15

Connecting the Dots: Design Thinking

- Develops new choices that balance the needs of individuals and society as a whole
- Creates strategies that address complex problems
- Employs approaches that create changes that matter and a sense of shared purpose that engages everyone affected by them
- Relies on our ability to be intuitive, to recognize patterns, to construct solutions that have emotional meaning as well as being workable and effective.
- Requires mapping of the context through multiple lenses

Source: Tim Brown. Change by Design.(2009) Harper Business.

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Working Together in a Complex System

- A discipline of reflection using shared qualitative and quantitative information rather than personal perceptions and beliefs alone.
- New patterns of interaction and conversation
- Adoption of an attitude of manageable risk and commitment to experimentation and a culture of inquiry
- Creation of usable information and new patterns of information flow

IN SUM: new ways of learning, defining success and working across traditional disciplinary lines



What Design Thinking Offers (1)

- Learning about people's **behavior** and how the systems we have designed behave and shape our choices. In these complex systems, the net effect can vary over time and from one person to another.
- Understanding and analyzing **culture**, the relationships we build with each other, our habits and routines, our view of the world and our beliefs. In academia, these are further shaped by our fields of study and our roles and working relationships.

What Design Thinking Offers (2)

- Defining **context**, the physical and virtual settings in which we function and how those spaces shape our choices.
- Setting **focus**: learning to work with ambiguity in early stages while looking for patterns and themes from different perspectives to guide next steps.
- Taking advantage of the **cross-disciplinary** and **inter-generational** environment of a campus to respond to complex challenges.

Source: adapted from Jon Freach *The Atlantic*, May 27, 2011.



Making Your Case for What You Want to Do Getting Started

- Is your campus prepared for what lies ahead? How well is your campus aware of and responding to societal changes and what can you learn from those experiences?
- What do you know about your students? Who is doing well and who is not and why?
- What kind of campus culture do you have? How do faculty, staff and administrators interact with each other? How are key decisions made and who makes them? How collaborative is your culture? (Not at all, in pockets, expanding, well-established)

Mapping Out an Approach to Change

- What do you know about the goals and expectations of your faculty and staff colleagues? What matters most to them? Have they embraced the necessity of supporting and participating in larger scale change in new ways?
- What do your colleagues “know” about change?
- Does your project line up with key campus priorities? What are those priorities? Is this agenda seen as connected to one or more of them?

Use Arguments that Fit Your Campus Culture

- How well are you able to read the environment in which you want to introduce or sustain major change?
- How should you talk about your work in order to fit your culture?
 - How are important decisions made at your institution and who makes them? Who is likely to be consulted before an institution-shaping decision is made?
 - Are issues usually seen through a political lens, relationships and cultural concerns, campus traditions and ways of doing things, other? Do people prefer technical solutions or adaptive ones?
 - What makes a more compelling and convincing case--quantitative arguments or qualitative arguments, including stories, images or both?
 - What kind of evidence is most likely to elicit interest and support?



Getting Started

- Setting Meaningful Goals: Take time to frame the questions you want to address in language that reflects local conversation and concerns.
- Selecting the First Target: Use design thinking to generate options and ways to assess the likely acceptance and impact of each approach using knowledge of local culture and earlier experiences that create capacity and interest.
 - Give serious thought to the process by which decisions are made and affirmed in your campus environment and what is regarded as legitimate. Use those governance structures if possible.

Designing Your Approach

Adapted from Rogers Diffusion of Innovations 1995

- **Relative advantage:** Is this new way likely to be better? If so, why?
- **Compatibility:** Is this consistent with the values, experiences and needs of the people who will use it?
- **Complexity:** Is this easy to understand?
- **Scalability:** Can you start small and grow?
- **Observability:** Are the result visible and compelling?
- **Adaptability:** Can this way be adjusted to different settings, disciplines/perspectives and situations?



Next Steps

- Making connections that reinforce and expand your effort: Look for similar efforts and position your project as logical next steps that built upon earlier work that can inform the new project.
 - Foster faculty leadership by engaging faculty in the scholarship and practices needed to advance the agenda. A good project will require learning along the way.
 - Approach learning as a *scholarly act* rather than as “faculty development.” Talk instead about faculty leadership.
- Learning from the experience: Involve both advocates and critics in defining measures to track progress and in interpreting the results.

Reinforcing and Promoting Deeper Organizational Change

As your project gets underway, it will soon become clear that additional adjustments and collaborations will be needed to create a supportive environment to sustain the change. The impact will ripple out in all directions!

Example: A revised curriculum focused on student success

- Changes in recruitment strategies and materials
- Adjustments in course enrollment procedures
- New forms of data collection in order to track the experience of participants as they move through the new curriculum pathways
- New collaborations with student support units.
- New faculty and staff roles and responsibilities and new roles for student leaders, peer advisors and tutors
- **Then move to the next cycle of innovation based on what you learned.**



Managing the Responses to Change

- Who may oppose your plans and what can you do to win them over, or, at least, keep them from derailing your efforts?
- How do reactions and rumors spread at your institution and what can you do to help people understand and support your efforts to adapt to the “new reality” that the Guided pathways initiative is responding to?”
- Are there other projects underway on that you can use to support your efforts?
- What traditions or values might become barriers that you need to address?
- How can you respond to misunderstandings about what you are doing and what your work means?
- How might you identify and then respond to objections and concerns about what you are doing or how you are doing it?



Remember the Essentials

- ✓ Practice the skills of a collaborative culture
- ✓ Examine your own assumptions and attitudes about your campus community, how change works and what it will take to build momentum and support for a different way of doing things. Check your assumptions with others.
- ✓ Set up a cycle of innovation and understand how a change effort unfolds (a.k.a., have a theory of action)
- ✓ Set up ways to learn from the experience that fit an academic culture.
- ✓ Use arguments that fit your campus culture or the culture of the part whose behavior and expectations you are trying to influence and change; e.g., a department.

WHAT ARE YOUR QUESTIONS? A Sample of many

- How can you help research-active faculty see instructional change efforts as valuable scholarly activities?
- How can we deal with initiative fatigue (PTDS Post-traumatic Distrust Syndrome) and why do so many faculty think that change is too hard?
- How can you encourage faculty to address equity and inclusion issues?
- How do you identify barriers and resistance and overcome them?
- How can you effectively interact with others beyond the institution, such as system offices, state education officers and employers to support changes in STEM education?
- How do you take a change effort to scale especially when there are frequent leadership changes and little if any financial support or encouragement?

What other questions do you have?



Now What?

If your questions weren't addressed, please contact me and we can explore your concerns.

Judith A. Ramaley

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We hope to see you at our next webinar:

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