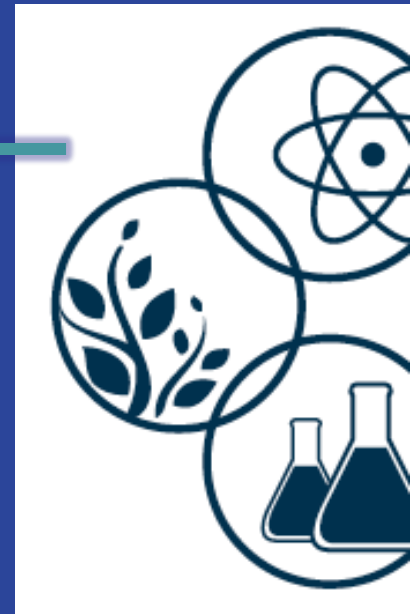
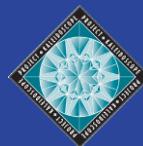


Interdisciplinary Learning in General Education

American Psychological Association
Education Leadership Conference

Susan Elrod, Project Kaleidoscope

September 12, 2011
Washington, DC



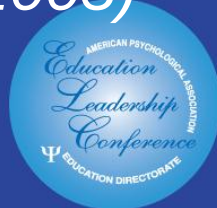
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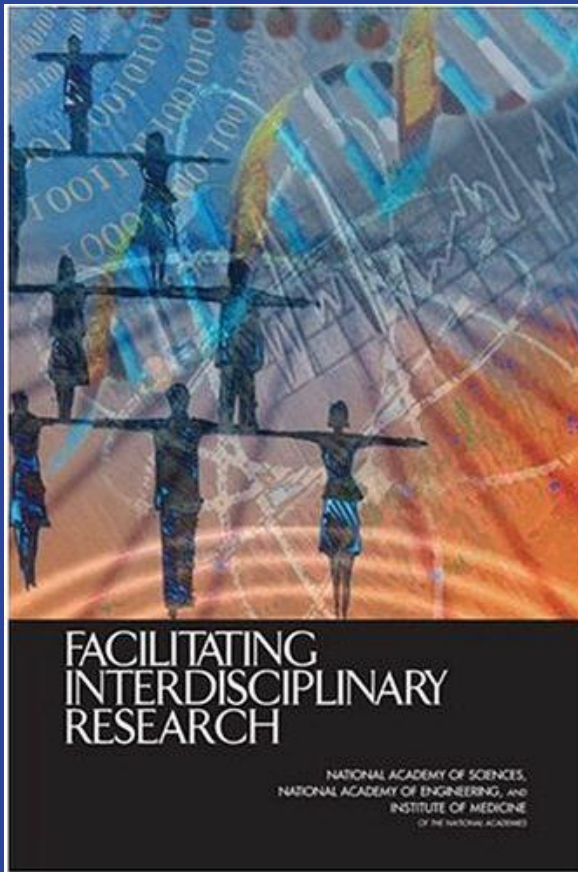


Whether we take a stance on the stem cell research controversy, interpret a work of art in a new medium, or assess the reconstruction of Iraq, a deep understanding of contemporary life requires knowledge and thinking skills that transcend the traditional disciplines. Such understanding demands that we draw on multiple sources of expertise to capture multi-dimensional phenomena, to produce complex explanations, or to solve intricate problems.

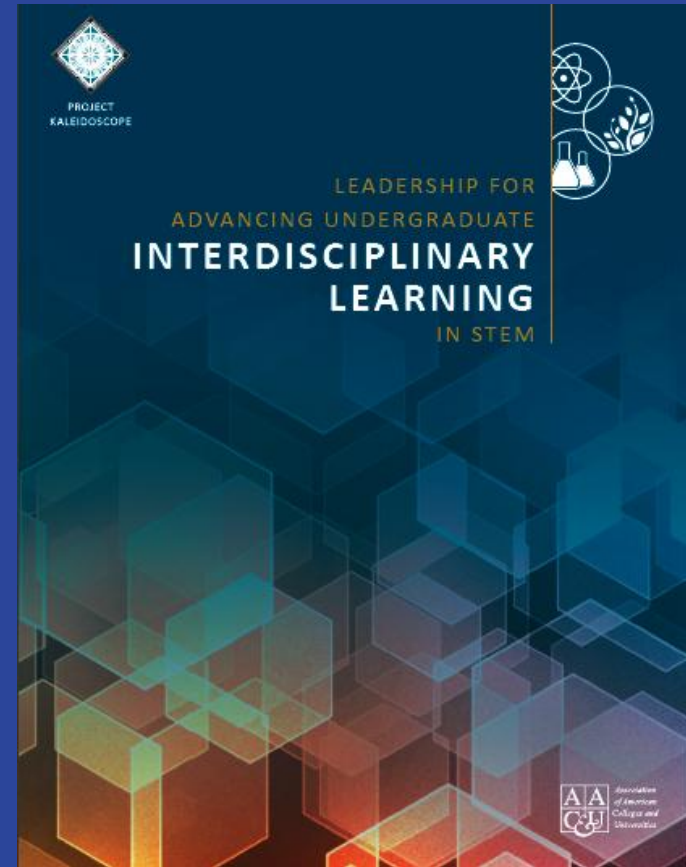
– Veronica Boix Mansilla
“Assessing Student Work as Disciplinary Crossroads”
(2005)

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2004

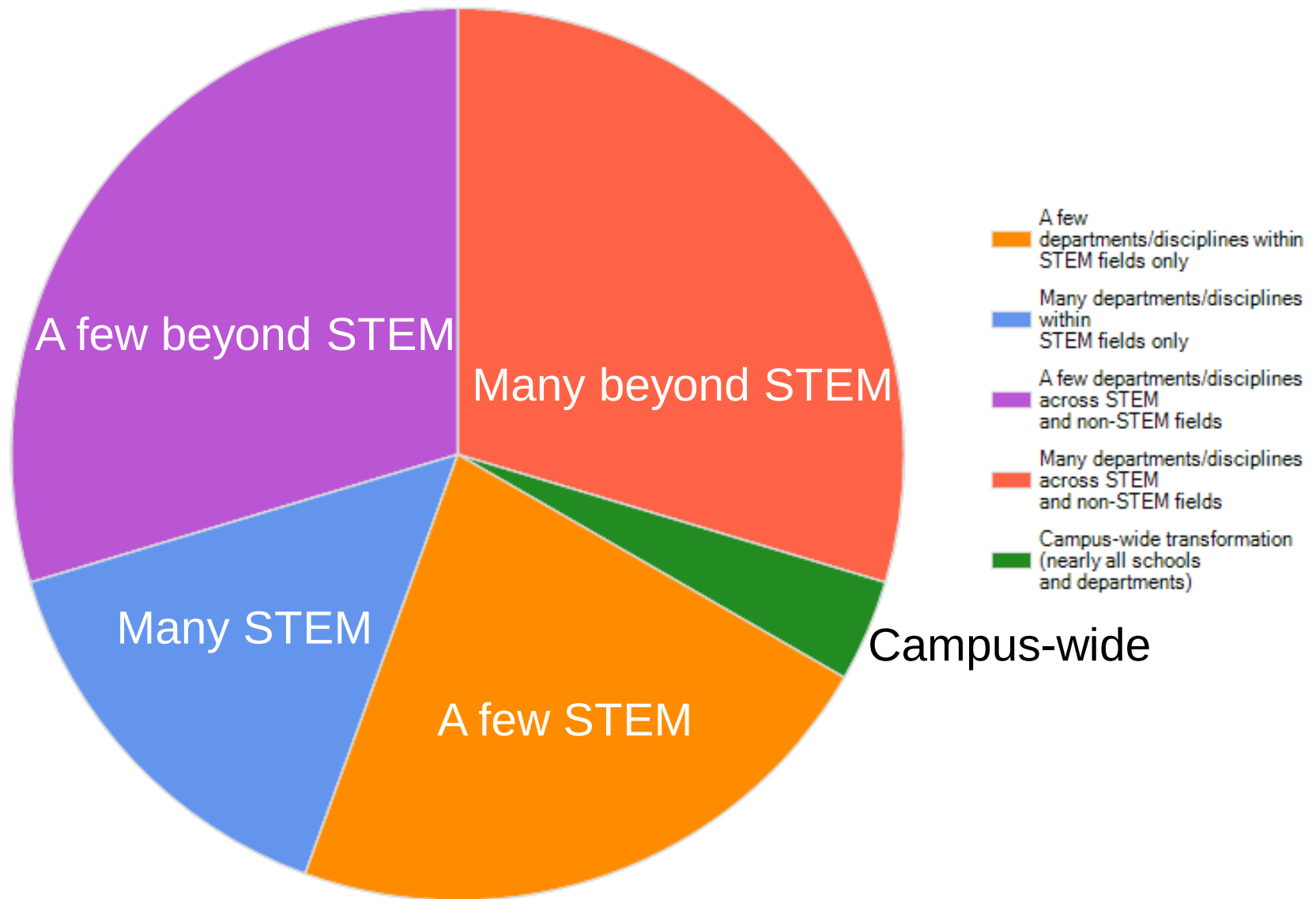


2011

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Program Types in the Project



Shared Vision and Goals

1. Start by articulating a common understanding of STEM interdisciplinary learning goals that will drive the cycle of curricular innovation, development, assessment, and improvement.

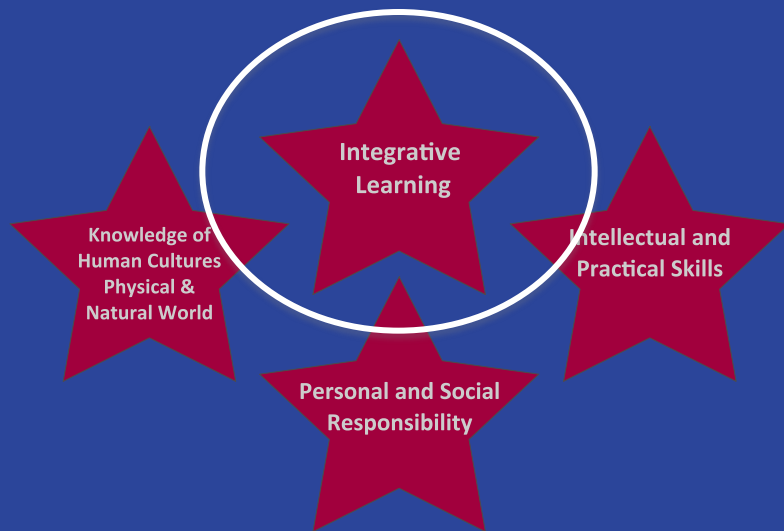




"You've got to want to connect the dots, Mr. Michaelson."

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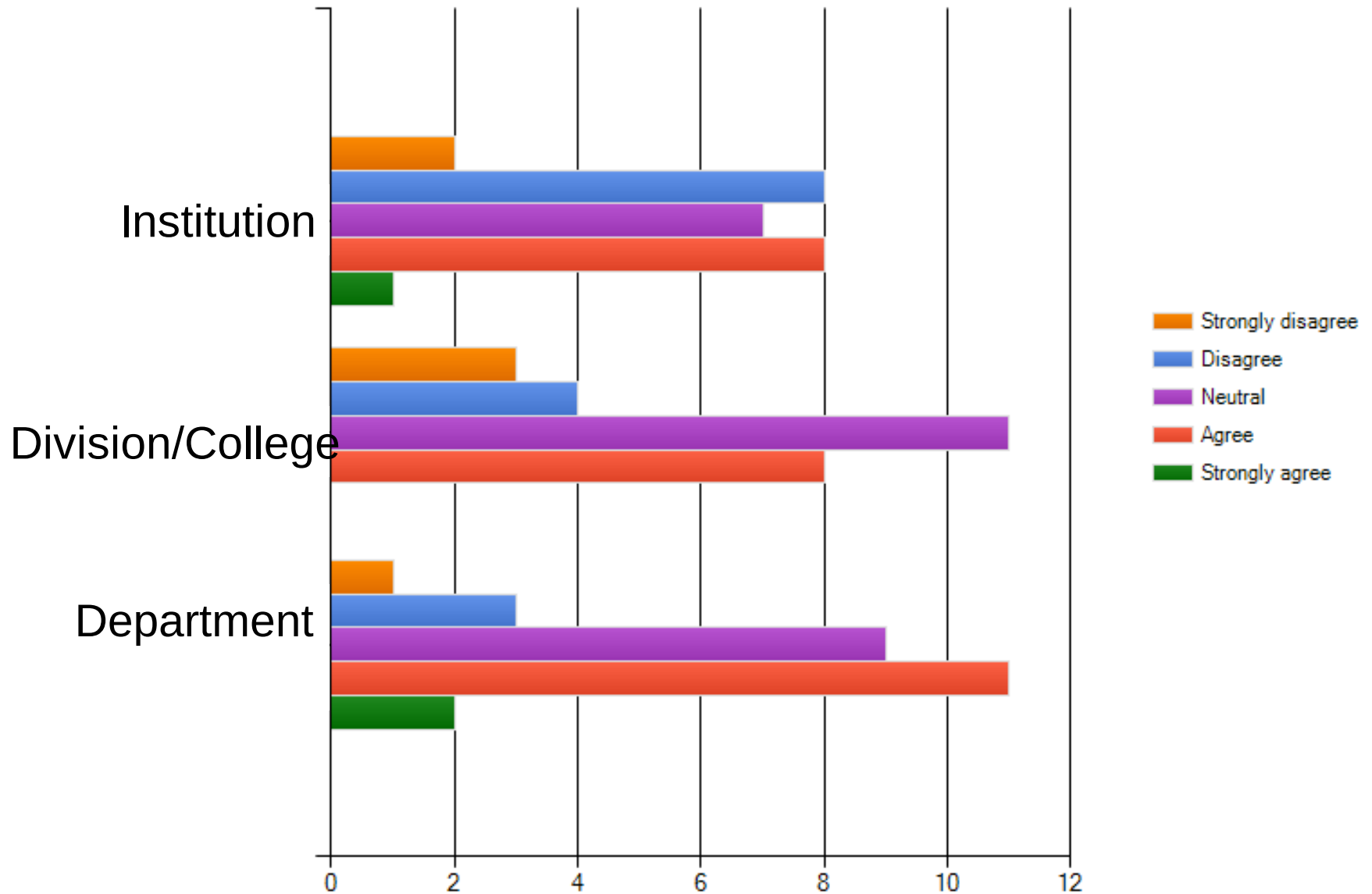
Interdisciplinary Learning Goals By Keck/PKAL TEAMS



LEAP – Liberal Education
for America's Promise

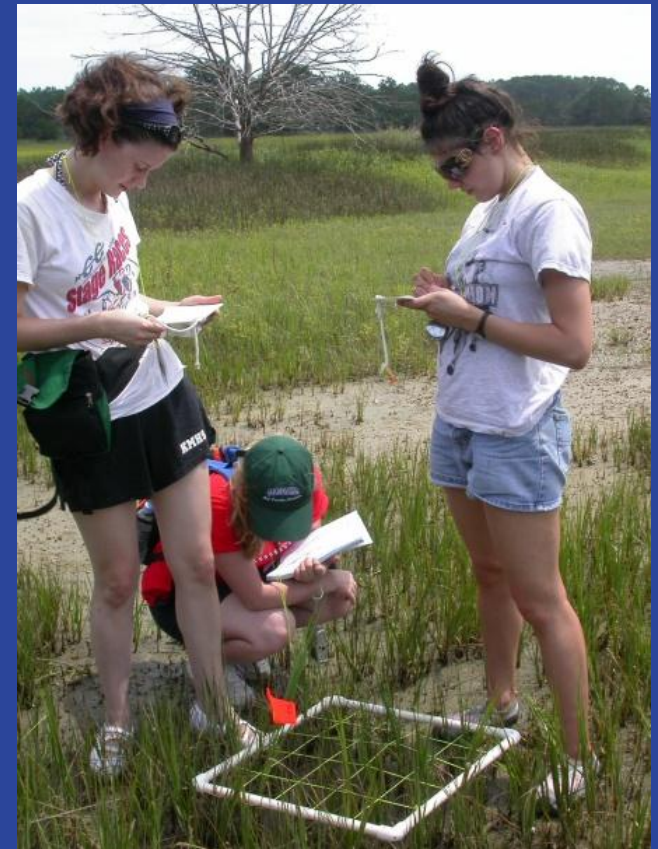
- **Recognize disciplinary** strengths, process, limitations, and perspectives.
- Purposefully **connect and integrate** knowledge and skills from across disciplines to solve problems.
- **Synthesize and transfer** knowledge across disciplinary boundaries, even beyond the STEM disciplines, in the context of novel situations.
- Be **agile, flexible, reflective thinkers** who are comfortable with complexity and uncertainty, and can apply their knowledge to respond appropriately and positively.
- Understand that other factors—**cultural, political, ethical, historical, and economic**—must be considered when addressing the complex problems of this century.
- Apply their capacity as integrative thinkers to **solve problems** in ethically and social responsible ways.
- Prepare for future learning as **lifelong learners** in their careers and as citizens.
- **Think critically, communicate effectively, and work collaboratively** with others within diverse cultures and communities.

Levels of Shared IDL Vision



Assessment

2. Use assessment to connect interdisciplinary learning goals with program structure, content, and pedagogy, paying attention to students as individual learners who come with diverse backgrounds, experiences, expectations, career aspirations, and goals.



ASSESSMENT INSTRUMENTS from Project Teams

RISC: David Lopatto, *et al.*
(w/ HHMI funding as well)

AAC&U VALUE RUBRICS

BSES

Biology Self-Efficacy Scale

CLA

Collegiate Learning Assessment

CURE

Classroom Undergraduate Research Experiences

FLAG

Field-Tested Assessment Guide

FSSE

National Survey of Student Engagement

NSSE

National Survey of Student Engagement

RISC

Research Integrated Science Curriculum

SALG

Student Assessment of Learning Gains

SURE

Summer Undergraduate Research Experiences

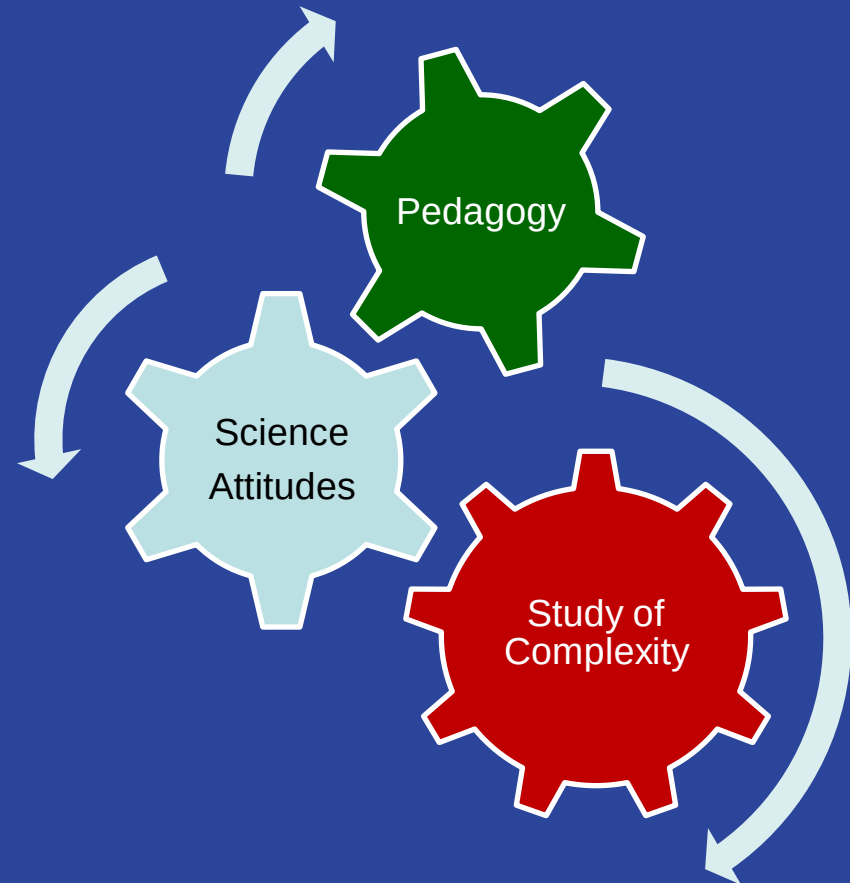
VASS

Views About Science Survey

What might we learn from RISC?

Once survey validity is more established, we will query RISC data with more “profound” questions.

EXAMPLE: What are the relationships between degree of independent learning (pedagogy), student attitudes about nature of science, and courses with a focus on complex ID problems or systems?



RISC: David Lopatto, et al.

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Learning Goals:

Items from Faculty survey common to “high” ID courses

- Students learn to ask "**big questions**" that implicate more than one discipline in a solution.
- Students learn about **two (or more) disciplines** so that **new insights** emerge from considering them together.
- Students learn to find **similarities and differences between disciplines** or fields of study.
- Students study **problems with multiple causes** that operate simultaneously and interactively.

RISC: David Lopatto, et al.

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Pedagogies:

Items from Faculty survey common to “high” ID courses

- Students engage in **class discussion**
- Students spend the entire course on **one or a few problems**
- Students work on **problems that have no clear solution**
- Students learn about **two (or more) disciplines** so that **new insights** emerge from considering them together
- Students have input on **design of a project**

RISC: David Lopatto, *et al.*

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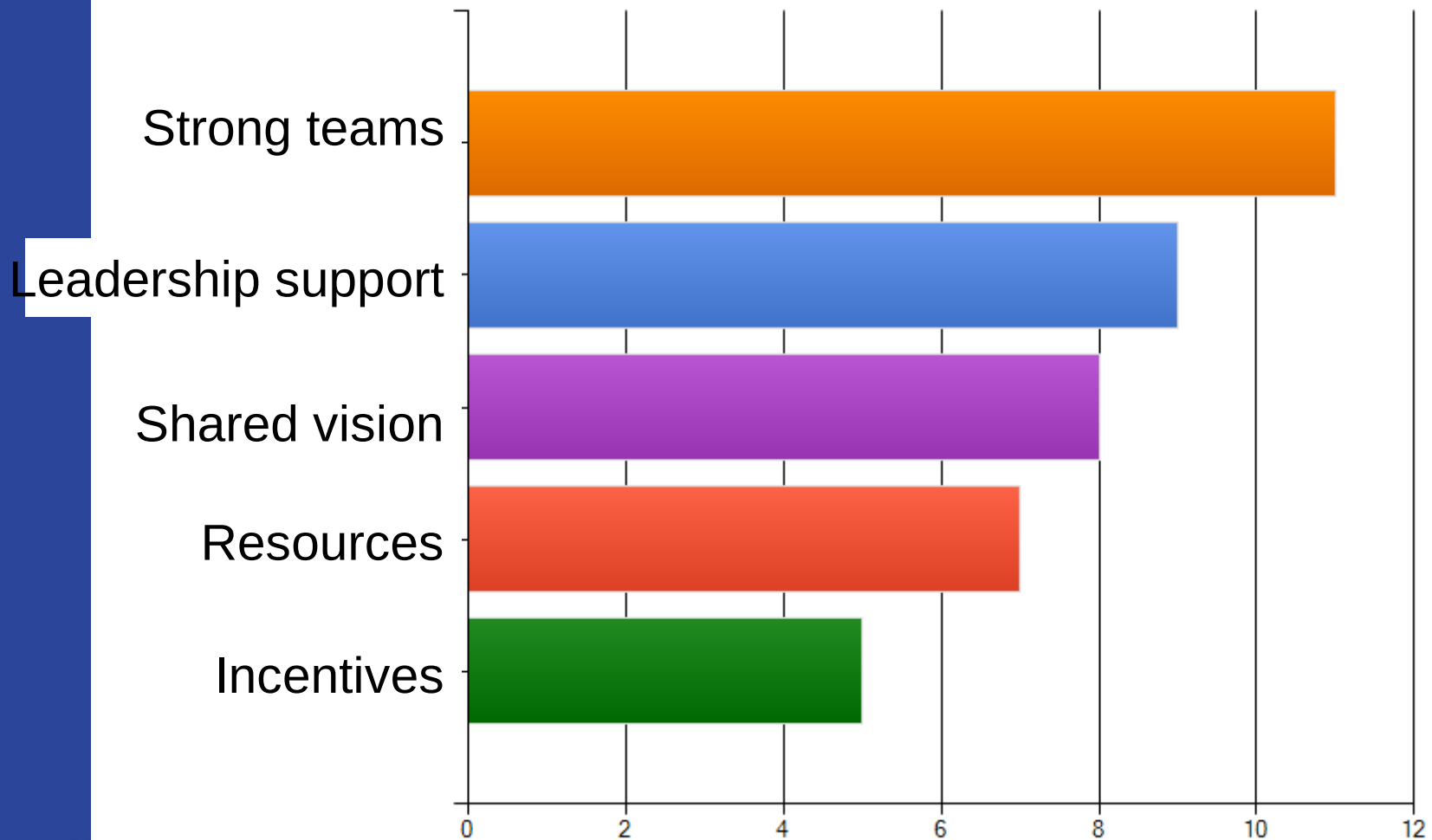


Faculty Community

3. Build a critical mass of faculty, from within and with new hires, that assumes leadership responsibility in the iterative process of shaping interdisciplinary curricular and co-curricular approaches and in assessing the impact of those approaches on undergraduate STEM learners.



Factors Facilitating the Change Process



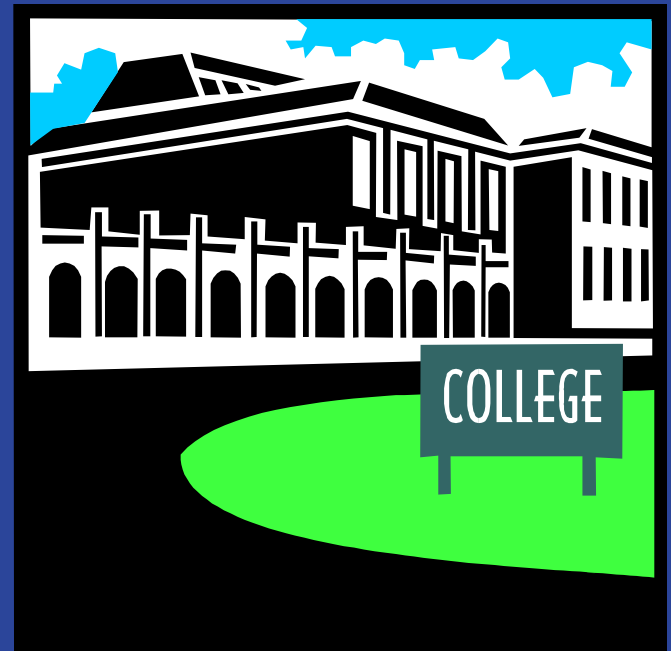
Top five for all responses shown

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Institutional Infrastructure

4. Incorporate interdisciplinary program needs into the processes of campus governance and resource distribution—financial, personnel, equipment, and spaces.



Resource Strategies

- Ensure interdisciplinary programs have the same rights and accountability responsibilities
- Ensure that interdisciplinary program faculty and directors are present at key budget, planning and governance meetings.
- Create transparent financial policies.
- Create governance documents or memorandums of understanding.
- Visibly support interdisciplinary projects with travel funds, meeting space, and course release.
- Leverage indirect costs from interdisciplinary grants.

Institutional Alignment

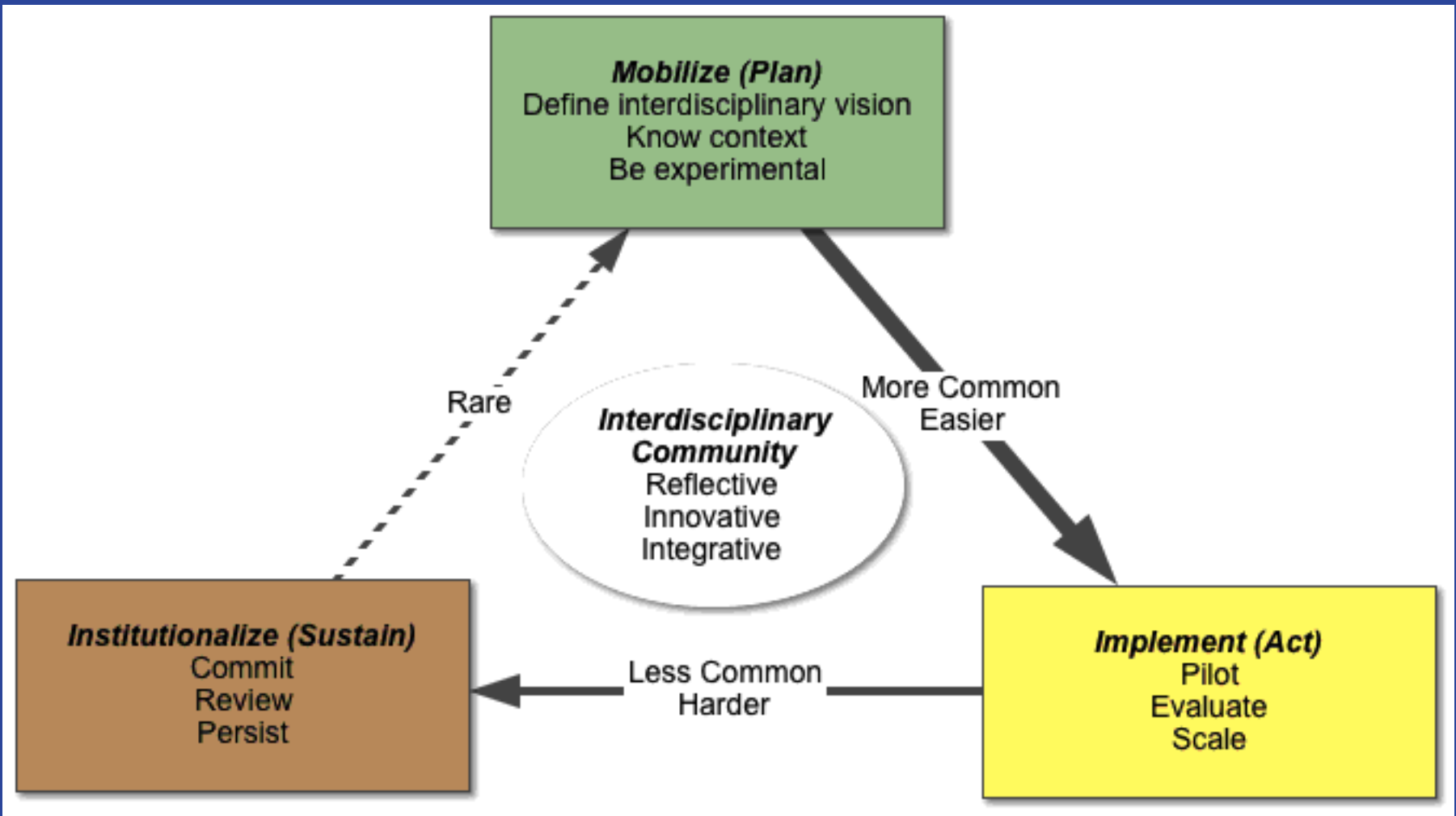
5. Align interdisciplinary learning with the institutional vision, mission, and identity, as well as in strategic planning processes at all levels.

“Another important lesson from this project is that institutions tend to overestimate barriers and that this overestimation can be a deterrent. Change agents tended to believe that there would be incredible campus resistance. The lesson learned from FIDL campuses is that while barriers should not be ignored, they should not overwhelm campus leaders.” – *Kezar and Elrod, 2011*

Barriers

- Departmental teaching obligations (with 84% of campuses marking this as “difficult” or “very difficult”)
- Risk- or change-averse culture (75%)
- Lack of resources (75.0%)
- Absence of incentives and rewards (with 66% indicating this as “difficult” or “very difficult”)

Process for Building and Sustaining Interdisciplinary Programs



This process takes 5-10 years!

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