



Council on Undergraduate Research

Learning Through Research

Importance of Undergraduate Research to STEM Student Success

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Council on Undergraduate Research

- **A national organization** of individual (>9,200) and institutional (>670) members representing all disciplines and over 900 institutions of all types.
- Ten **discipline-based divisions**: Arts & Humanities, Biology, Chemistry, Geosciences, Health Sciences, Mathematics & Computer Science, Physics & Astronomy, Psychology, Social Sciences, Engineering.
- Two **multidisciplinary, administrative-based divisions**: At-Large and Undergraduate Research Program Directors.

The mission of CUR is to support and promote high-quality undergraduate student-faculty collaborative research and scholarship.



CUR Resources

That promote and support undergraduate student-faculty research and scholarship

MEETINGS

National Faculty Conferences

National Conference on
Undergraduate Research

CUR Dialogues

Institutes & Workshops

Posters on the Hill

SERVICES

Consulting Service

Mentor Network

Grant Preview Service

CUR Fellows/Goldwater Scholars
Awards

Listservs

Advocacy

PUBLICATIONS

CUR Quarterly

“How To” Series

Specialized Volumes



Key Questions

- What aspects of undergraduate research (UGR) make it important for STEM success?
- Are there differences in UGR practices within STEM and between STEM and non-STEM disciplines?
- Why can we term UGR a “first among equals” for STEM experiential learning?
- How do we expand UGR cost-effectively?

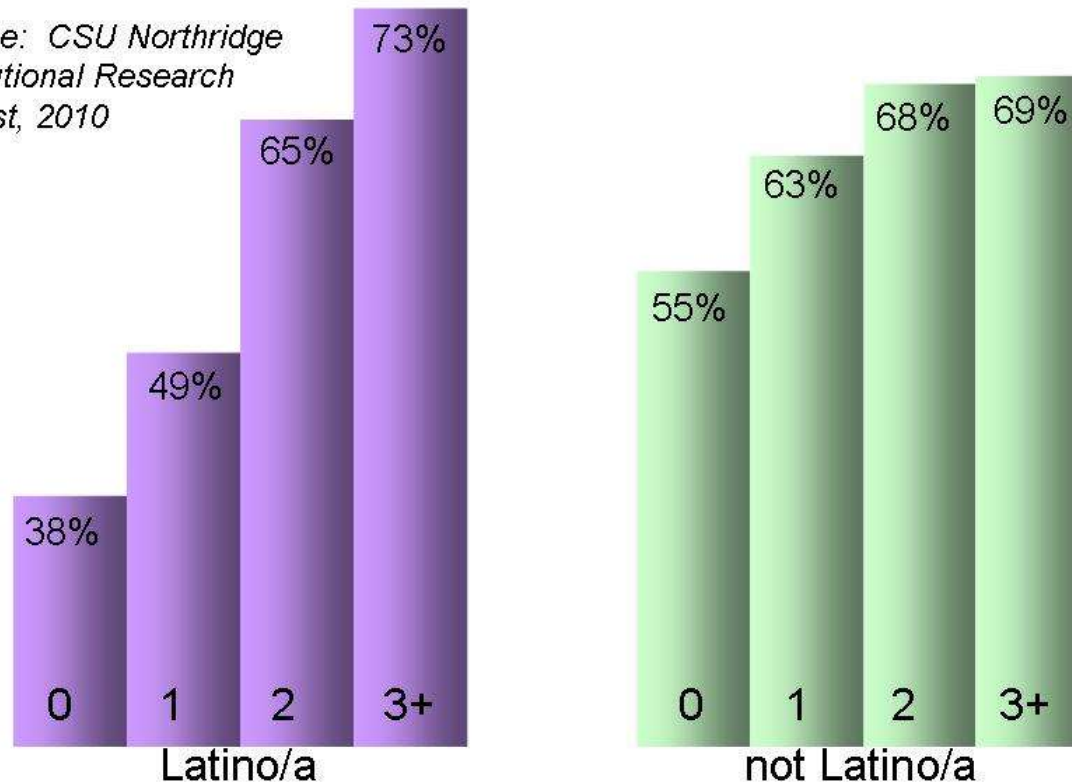
UGR: Success Domains

- Increased aspirations and persistence
- Core STEM professional competencies
- Mentorship and learning communities

California State University Data Demonstrate HIP Effectiveness

CSU Graduation Rates by Ethnicity and participation in High-Impact Practices

*Source: CSU Northridge
Institutional Research
August, 2010*



Source: B. Huber, CSU Northridge Institutional Research

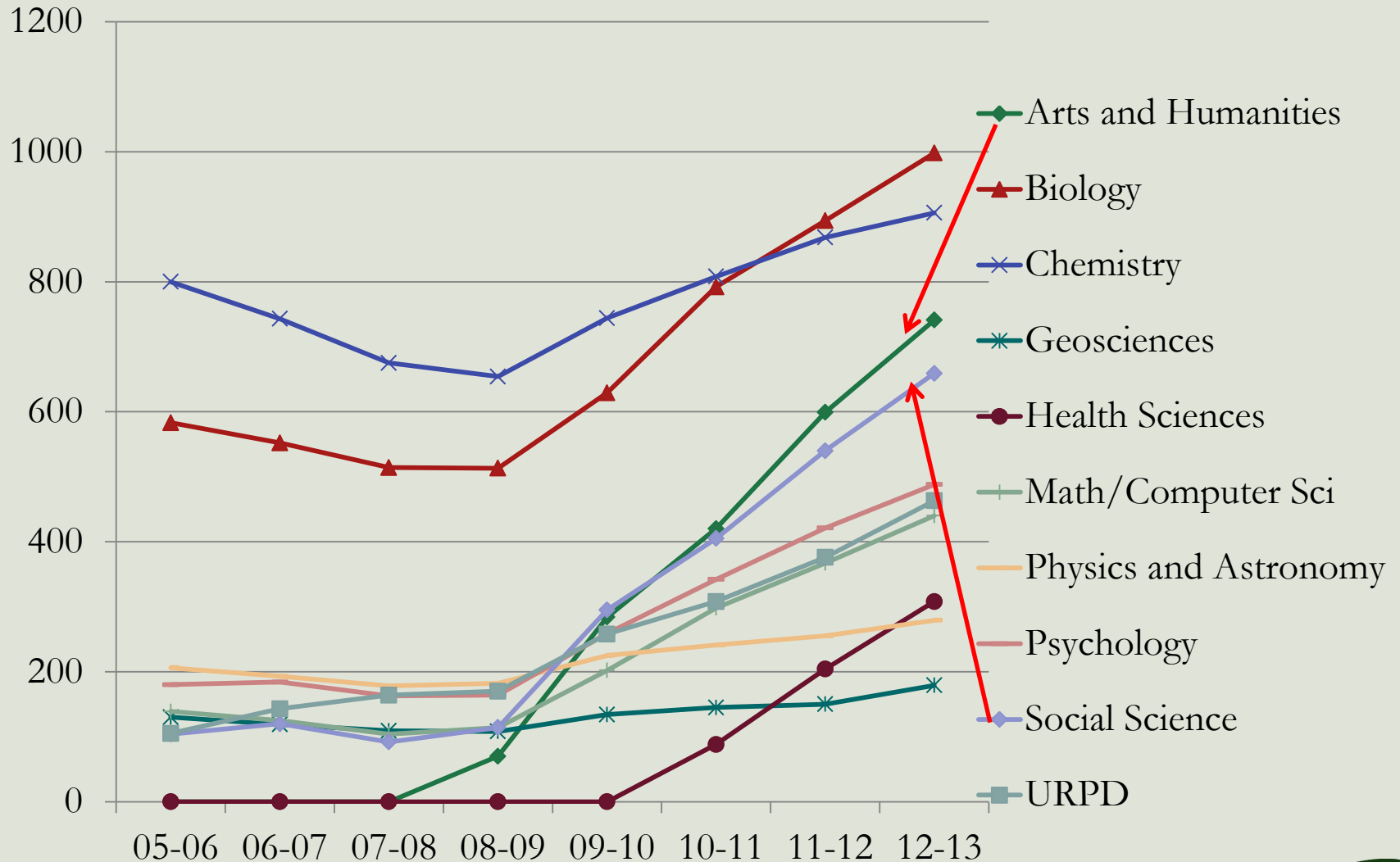


UGR: Within STEM and Beyond STEM

- Practices have similar attributes across disciplines
- Vocabulary differs
- UGR has expanded to all disciplines
- Differences in UGR practices linked more to type of institution:
 - PUIs dominate

CUR Disciplinary Membership Patterns

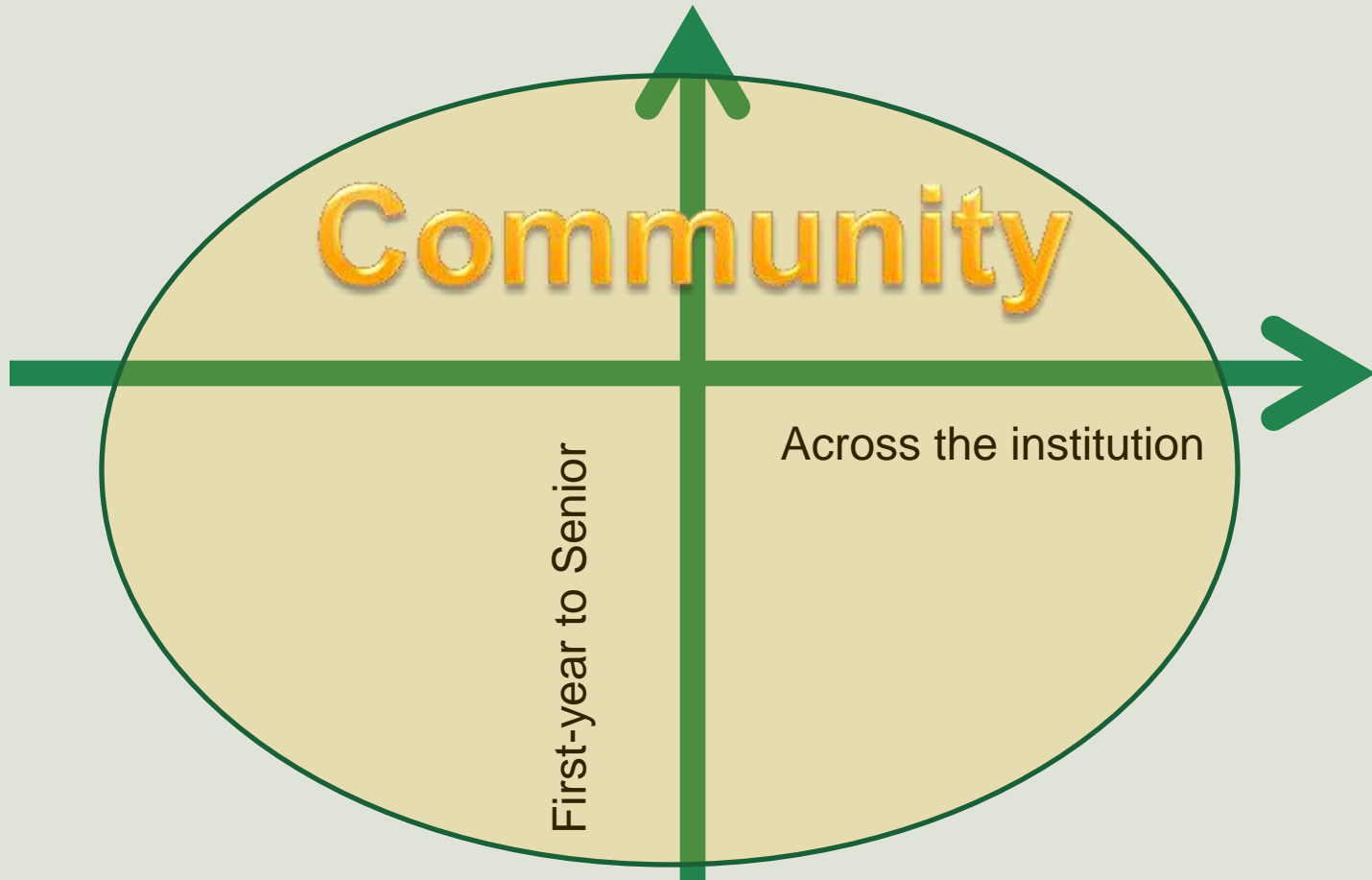
Exhibit Broadening of Undergraduate Research's Appeal



UGR: “First Among Equals”

- Federal funding of research provides significant support for UGR, allowing institutions to leverage other resources
- Faculty advancement tied to research, teaching, and service: UGR can support all three
- Other high-impact practices and student success initiatives can be included in UGR programming, particularly with centralized UGR office

UGR Expansion: Horizontal and Vertical Integration





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President's Council of Advisors on Science and Technology

Undergraduate Research:
A Right Not a Privilege

*PCAST Recommendation: Advocate and provide support for replacing standard laboratory courses with discovery-based research courses.**

*From: PCAST Report: "Engage to Excel", released February 27, 2012



Undergraduate Research: A Variety of Modes

- Summer immersion
- One-on-one mentoring for semester or year-long projects
- Research-based curriculum (primarily upper division)
- Research-infused curriculum (often lower division)



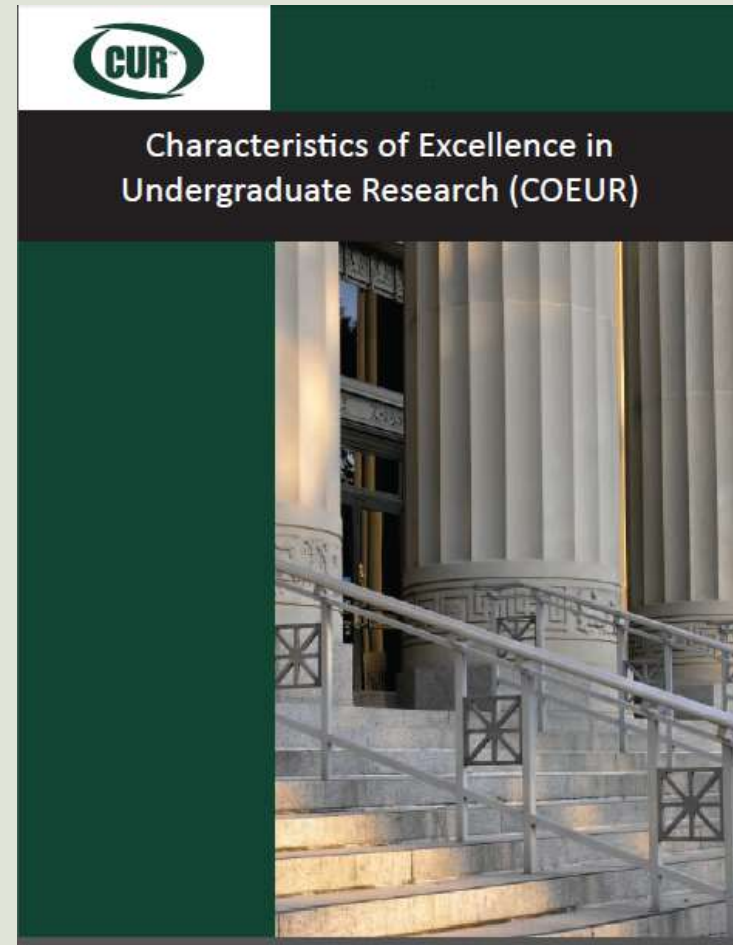
**Decreasing
cost per
student**

UGR: Scaling up and Scaffolding – HOW?

- Institution-wide
 - ***Characteristics of Excellence in Undergraduate Research*** best practices
- Department or College-based
 - Curriculum redesign to emphasize research
 - Alignment of faculty recruitment, retention and advancement

COEUR – Characteristics of Excellence in Undergraduate Research

- ❖ Key Success Factors:
- ❖ Establishment of central UGR campus office
- ❖ Extensive student/faculty participation in campus, regional, and/or national UGR celebratory events
- ❖ Development of consistent assessment of UGR's impact
- ❖ Establishment of policies for recognizing/rewarding faculty engagement in UGR





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