Connecting Diverse Stakeholders to Scale-Up and Scaffold Undergraduate Research: Developing Blueprints for Student, Faculty, and Institutional Change

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Council on Undergraduate Research

- A national organization of individual (>9,400) and institutional (>670) members representing all disciplines and over 900 institutions of all types.


- 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 Disciplinary Membership Patterns Exhibit Broadening of Undergraduate Research’s Appeal
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 Question Cycle

WHY?

How can we scale up and scaffold undergraduate research?

But first.....
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: “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
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.

UGR Expansion: Horizontal and Vertical Integration

First-year to Senior

Across the institution
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)
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

www.cur.org
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
Four Main Topics for PKAL

EASY

- How do we incorporate more student research into upper division courses?
- How do we integrate research across the curriculum?
- How do we improve the effectiveness of faculty mentors?
- If we recognize that the department is the unit of change, how do we effect that change?
How Do We Incorporate More Student Research Into Upper Division?

• Is research a significant part of your department’s undergraduate major degree requirements at the upper division level?

• If yes, what form(s) does/do this requirement take?

• If no, what are some of the reasons why this has not occurred?
Four Main Topics for PKAL

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Promising Practice: HHMI SEA PHAGE

- Investment by Howard Hughes Medical Institute supported Science Education Alliance to insert phage discovery (associated with soil bacterium) into introductory biology (http://www.hhmi.org/programs/science-education-alliance)

- Based on program developed by Graham Hatfull at University of Pittsburgh
Question:

• Is research scaffolded through your curriculum as a developmental process, with attention to research skill development?
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Promising Practice: Elon University CEL

- Elon University has initiated a multi-year institute for faculty practitioner/researchers interested in investigating aspects of the faculty-mentored undergraduate research experience
- [http://www.elon.edu/e-web/academics/cel/mentoringur/](http://www.elon.edu/e-web/academics/cel/mentoringur/)
Question

• In there a feedback process in place whereby faculty mentors receive input from students they have mentored, other faculty and/or staff (particularly those with expertise in student development) on their performance as a mentor?
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Promising Practice: University of San Diego Chemistry Department

- Curriculum designed with research focus
- Department of Chemistry and Biochemistry at USD develops shared goals for scholarship, including planned grants and publications
- Meet frequently as a department to revisit progress toward goals
- Received award from RCSA for department development
- [http://www.sandiego.edu/cas/chemistry/](http://www.sandiego.edu/cas/chemistry/)
Promising Practice: CSU Dominguez Hills Anthropology

- Entire curriculum is built around student research
- Faculty hired with expectation that they will work as a team and incorporate research into the curriculum
- Students have on-line research journal
- [http://www.csudh.edu/anthropology/](http://www.csudh.edu/anthropology/)
Question

• Are departments held accountable for student success in the major, in the form of goals for reduction of D/F/W rates, increases in student retention and graduation?
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