Developing/Emerging Research Institutions: Opportunities and Challenges for Comprehensive Institutions

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RESEARCH INFORMS TEACHING!!!

"Teaching without research is like confession without the sin"

Shirley Ann Jackson
President, Rensselaer Polytechnic Institute;
First African American woman to earn a Ph.D. in Theoretical Physics from MIT in 1973

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Acknowledgments

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Partnership for Emerging Research Institutions

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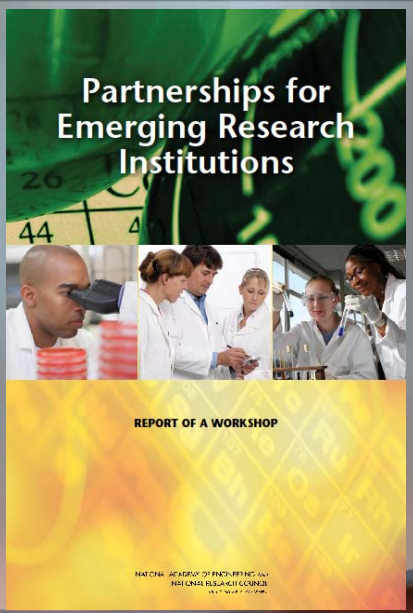

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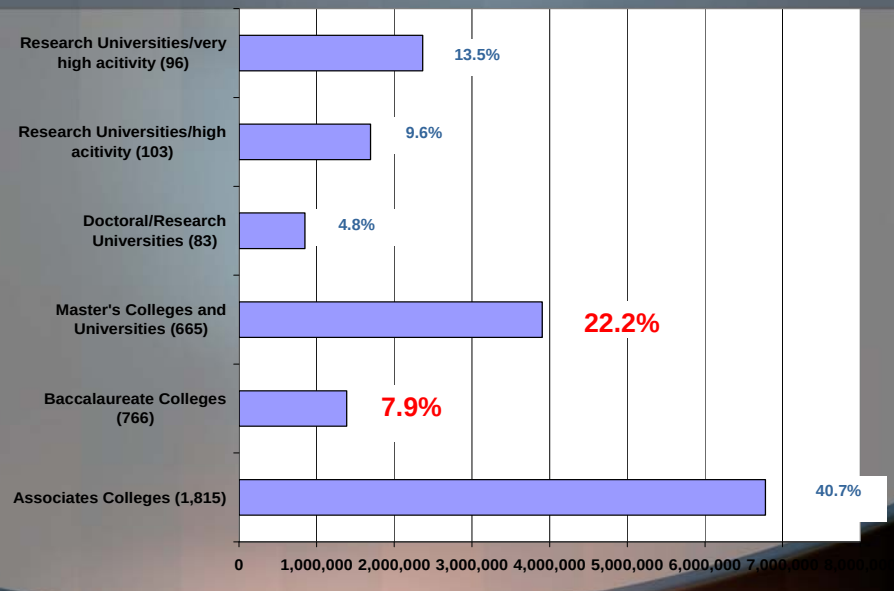
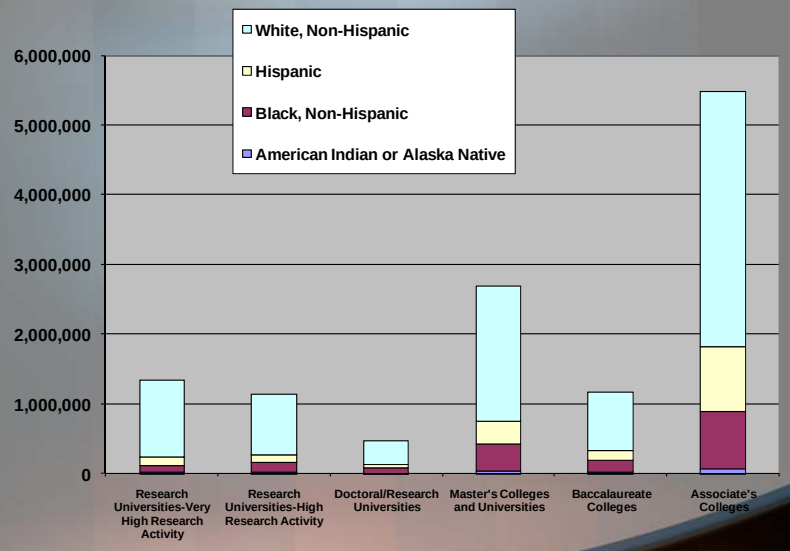
Workshop Questions

- What does the presence or absence of basic research signify for student achievement?
- What obstacles/challenges currently preclude access to research for D/ERIs?
- What approaches/solutions can be used to overcome these obstacles?

Distribution of Institutions and Percentage of Total Enrollment



Undergraduate enrollment by race/ethnicity (Fall 2005 data)



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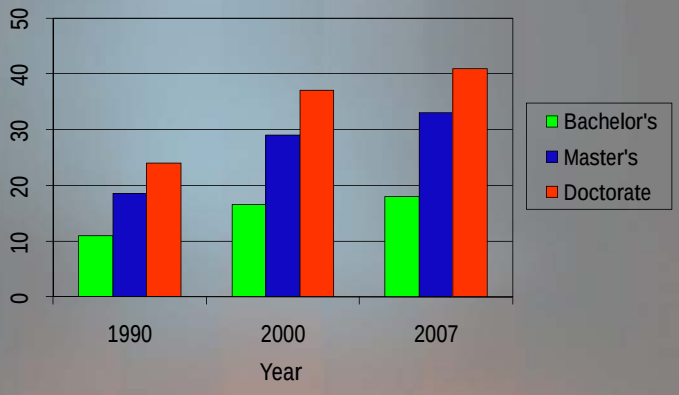
OUR INCREASING RELIANCE ON FOREIGN 'STEM' TALENT



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Significance of Developing/Emerging Ris

- Over 30% of all postsecondary students and 55% of graduate students in all fields are enrolled at BA- and MA-Degree granting institutions
- These institutions enroll the majority of underrepresented minority students in all ethnic/racial groups
- These institutions are a largely untapped national resource for scientific innovation
- Increasing the research capacity at D/ERIs strengthens the U.S. higher education and research enterprise as a whole, and possibly lessens our reliance on foreign talent

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R&D Expenditures in Sciences and Engineering (Federal funds)

2005 Carnegie classification	Federally Financed Academic R&D Expenditures	% by Carnegie
Research Universities-Very High Research Activity	$13,387,130	72.2
Research Universities-High Research Activity	$2,501,287	13.5
Doctoral/Research Universities	$462,831	2.5
Master's Colleges and Universities	$606,220	3.3
Baccalaureate Colleges	$145,606	0.8
Special Focus Institutions-Medical schools and medical centers	$1,165,581	6.3
Other	$283,793	1.5
Total	$18,552,448	100.0

Dollar amounts are in thousands.
SOURCE: NSF Survey of Research and Development Expenditures at Colleges and Universities.

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Challenges to Developing/Emerging RIs

- Implicit bias regarding the ability of faculty at D/ERIs to do meaningful, publishable, and fundable research with potential for practical applications
- Inherent labeling of them as PUIs (Predominantly Undergraduate Institutions) and/or Liberal Arts institutions, thus minimizing their research potential
- Age old philosophical divide between "teaching" and "research' at these institutions rather than focused conversations about research being an effective pedagogy for teaching and learning

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Challenges to Developing/Emerging RIs

- Limited time for faculty research
  - High teaching and advising loads
  - Significant service expectations
- Limited support for faculty research agendas
  - Insufficient rewards system
  - Limited access to designated research space
  - Minimal research start-up packages
  - Limited support staff (lab technicians; graduate assistants)

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Challenges to Developing/Emerging RIs

- Limited institutional resources
  - Office of sponsored research?
  - Office of technology transfer?
  - Business services support
  - IT infrastructure and staff support
  - Funding for equipment and equipment maintenance
  - Funding for library acquisitions

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Proposed Solutions: Pieces of the Whole

- Administrative leaders must commit to supporting research on the comprehensive campus as a means to encourage faculty development, inform instruction, and foster undergraduate learning

- Administrative leaders must encourage dialogue around the importance of undergraduate research in developing the "knowledge economy" and preparing students for success in the 21st century: It's not an option, it's a requirement!

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Proposed Solutions: Pieces of the Whole

- Invest in research and the undergraduate research agenda
  - Create an Office of Sponsored Research to support grant-writing efforts
  - Commit matching funds and in-kind support for grants
  - Develop new faculty position descriptions to attract faculty who integrate research and teaching, and whose research agendas and dispositions support the undergraduate research model
  - Focus on creating core groups of faculty with expertise in related areas
  - Reassign graduate assistants to areas of high need

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Proposed Solutions: Pieces of the Whole

- Faculty research time
  - Consolidate some small classes into fewer large ones
  - Assign credit toward workload for a series of individual mentored research experiences
  - Consolidate teaching schedules to free up blocks of time for research
  - Provide strategic “reassigned time” for research (new and experienced research-active faculty)
  - Encourage faculty to pursue research activity which can be integrated with the undergraduate research experience

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Proposed Solutions: Pieces of the Whole

- Invest in research and the undergraduate research agenda
  - Provide training to business services staff to manage grant funds
  - Develop an equipment inventory, as well as maintenance and replacement plans
  - Partner with other institutions to increase access to library resources and increase IT functionality

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Proposed Solutions: Pieces of the Whole

- Develop a reward system which signals support for research
  - Tenure and post-tenure review policies
    - Greater emphasis on research in faculty evaluations
    - Focus on faculty-directed, undergraduate research as a high-impact practice fostering excellence in teaching and learning
  - Recognize research activity and success through institutional awards, reassigned time, feature articles, external awards
  - Sponsor a “Faculty Research Day” and “Undergraduate Research Day” to showcase projects and talent

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Proposed Solutions: Pieces of the Whole

- Develop a reward system which signals support for research
  - Financial incentives
    - Internal institutional grant competitions
    - Strategic investment in faculty (reassigned time for grant-writing and research)
    - Return some amount of overhead to PI's and departments as incentives to write grants and carry out research

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SUMMARY

- Administrative and faculty leadership is pivotal in developing a research climate
- Develop a research culture and embrace the "teacher-scholar" and "undergraduate research" models
- Administrators and faculty must be equally well informed about the value and cost of doing research
- Adopt an innovative growth model and provide seed capital and other support for emerging and potentially productive research programs

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The University of Wisconsin-La Crosse Model

- Began in the1990's with a core group of faculty with strong research skills and a passion for teaching
- Precedent of mentored research in the River Studies Institute
- Grant to support mentored summer undergraduate research projects with Native American students
- Intentional valuing of the connection between research and teaching over time in policy development, hiring, allocation of resources, grant-writing

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Examples of UW-L Solutions/Approaches

- Hire a Grant Writer
- Provide start up funds for new faculty
- NEA, NEH and NSF-SBE Division at UW-L (September 2010) to promote grant seeking by faculty in the Arts, Humanities and Social Sciences
- Provide summer stipends for new faculty to support grant-writing activity
- Provide grant match for selected grant proposals
- UW-L "Academic Initiatives" fund to support undergraduate and graduate student research

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UW-L Academic Initiatives

- A student led initiative where students pay differential tuition to support various student-centered services and activities
- Started in 2004-2005 with a vote of the Student Senate ($30/semester through 2009-2010; $60/semester beginning 2010-2011)
- Funds used to support undergraduate research, the Academic Advising Center, the Learning Center, the library, and campus internationalization efforts

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Total Return on Investment In New Faculty

(July 2004 - Dec 2009)

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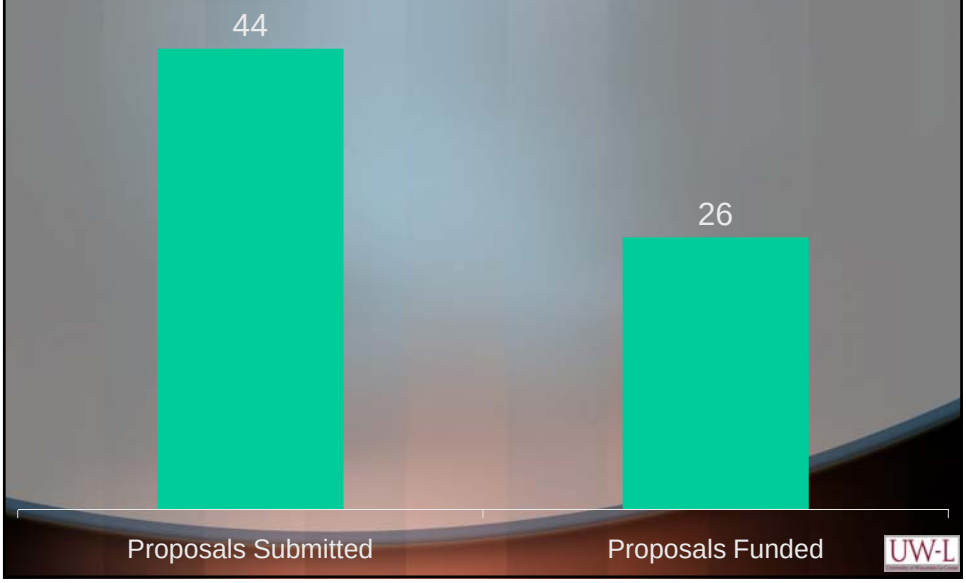
History of grants funded and submitted

Success Rate of 59% (July 2003-Dec 2009)



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Gaining Momentum . . .

- WiSys (Intellectual Property protection/tech transfer)
- “Research-to-Jobs” Presidential Taskforces
- Emerging Technology Centers
- Legislative agenda in Wisconsin

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CRITICAL NEEDS MOVING FORWARD

- Creating a strong and sustainable institutional culture for "research" (not at the expense of teaching and learning)
- Infrastructure, infrastructure, infrastructure
- Collaboration, collaboration, collaboration

What would it take? *RESOURCES ($$$)*
Who should fund it? *FEDERAL R&D*

National Science Foundation

Congressional Directive for NSF in 1978:

"… it shall be an objective of the Foundation to strengthen research and education in the sciences and engineering, including independent research by individuals, throughout the United States, and to avoid undue concentration of such research and education."

National Science Foundation

THIS LED TO THE DEVELOPMENT OF:

Experimental Program to Stimulate Competitive Research (EPSCoR)

NOW WE NEED:

ERIC (**E**nhancing **R**esearch **I**nfrastructure **C**apacity) grant program for D/ERIs

A MODEST FUNDING PROPOSAL

ERIC Goals:

- To provide strategic programs and opportunities for D/ERIs that stimulate sustainable improvements in their R&D capacity and competitiveness.
- To advance science and engineering capabilities of D/ERIs for discovery, innovation and overall knowledge-based prosperity.

EPSCoR FACTS

- Established at NSF in 1979 to enhance research capacity and catalyze focused R&D in states where the federal R&D funding was below the national average
- 30 years later, the 27 EPSCoR jurisdictions (started with only 5 states) account for 20% of the U.S. population, 25% of the research/doctoral institutions, and 18% of the employed scientists and engineers
- About 10% of all NSF R&D goes to EPSCoR states
- 22% of the 181 Goldwater Scholars in 2005 were enrolled at Universities in EPSCoR states

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FINAL THOUGHTS

- Further define Developing/Emerging Research Institutions and gain due recognition for research capacity of D/ERIs
- Change the conversation about research as a pedagogy for teaching and learning
- Align institutional resources to encourage and enable student engagement in high stakes, faculty-mentored research
- Create a strong voice for D/ERIs to advocate for Federal resources like ERIC

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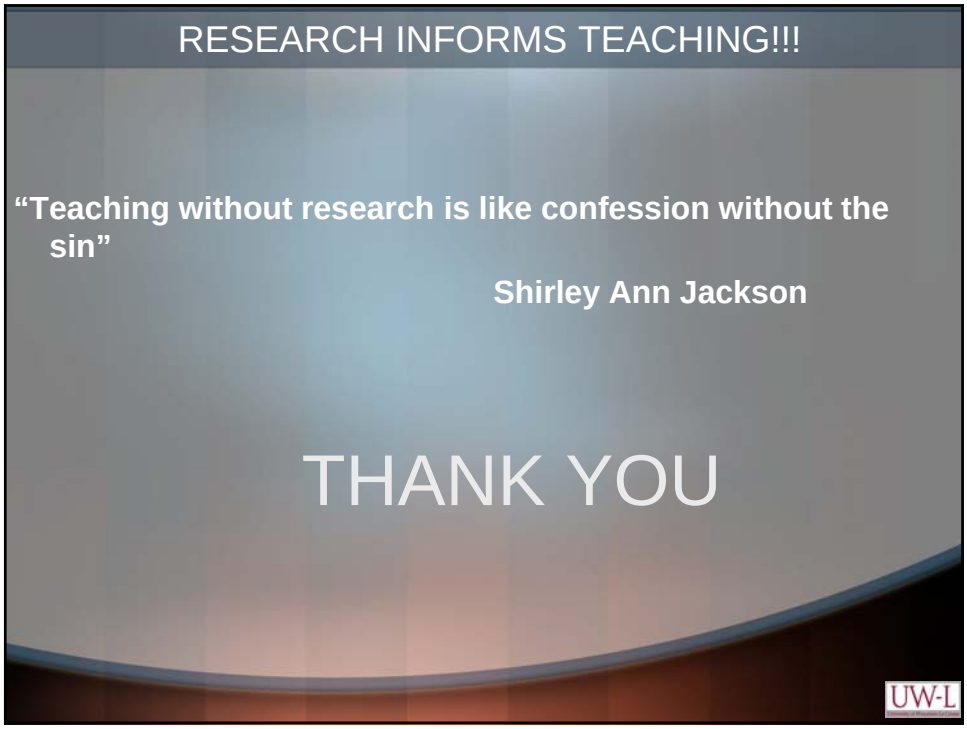
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THANK YOU
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