FIU: Transforming STEM Education

Creating a National Laboratory for Change

November 30, 2012

50,000 Fall 2012 enrollment
52,000 Fall 2015 student enrollment
100,000 Students will graduate from FIU in the next decade
3,513 Dual enrollment students
167,000 Alumni
180 Bachelor's, master's and doctoral programs
96 Percent of faculty hold doctoral degrees or highest degree attainable in their field
12 Colleges and schools including Medicine, Law and Architecture
FIU STEM by the Numbers

1st in awarding STEM degrees to Hispanics

51,000+

degrees awarded to under-represented minorities during the past decade

84%

of FIU degrees are awarded to minorities

1,693

STEM graduates in 2010-2011

Excelencia in Education Report

The Top 25 Institutions Graduating Hispanics in STEM

47%

of STEM degrees awarded to Hispanics nationally by Top 25 institutions

60%

of doctoral STEM degrees awarded to Hispanics nationally by Top 25 institutions
PCAST recommendations provide a framework. But, we must be bolder when it comes to underrepresented minorities.

Recommendation 1: Catalyze widespread adoption of empirically validated teaching practices

Recommendation 2: Replace standard laboratory courses with discovery-based research courses
Discovery Learning
Achieving Equity for Minorities

Growth in Physics Majors

Number of Intended and Declared Physics Majors

- Majority
- Underrepresented Minorities
Recommendation 3:
Launch a national experiment in postsecondary mathematics education to address the math preparation gap

Goals for pass rates in College Algebra

2010: 33%
2011: 41%
2012: 49%
2013: 57%
2014: 65%
2015: 73%
Recommendation 4:
Encourage partnerships among stakeholders to diversify pathways to STEM careers

Robust Partnership with Miami-Dade County Public Schools

- Quarterly meetings with Superintendent and top leadership
- Targeted agenda, 10 task groups
- Community partnership with Miami Northwestern Senior High
- Sponsored by JPMorgan Chase
- Quadrupled enrollment
FIU and the Department of Energy Fellows Program

65
Department of Energy Fellows since 2007

26
fellows obtained graduate degrees

12
hired by federal agencies

100
Percent of graduates working in the energy industry
Challenges remain

- Mathematics
- Place-bound students: going where the jobs are
- First generation students are unique

Going forward as a nation

- Underrepresented minorities should be a major thrust of national plan and movement
- Focus on workhorses: public, urban, research, minority-serving institutions that are engaged with K-12
- STEM corporations also must change their approach
- Immigration + STEM
Recommendations for the Federal Government

- Holistic effort, akin to the National Defense Education Act
- Network of STEM Transformation Institutes
- GI BILL-like for STEM teachers
- Incentivize K-12, community college, and university collaboration
- Break the silos: NSF, ED, DOD, ENERGY, others