



ERC Meeting
and
Engineering Ed and Centers

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Allen L. Soyster



Brief History and Present Facts



- EEC Division formed in 1992
- 50 ERCs (since 1984)
- Four Foci
 - ✓ Centers (65% funding)
 - ✓ Human Resources (10%)
 - ✓ Engineering Education (10%)
 - ✓ (Stipend – GRF, IGERT, K-12, Brige)(15%)
- 138 million (Request for 2011)



EEC Objectives for 2020



1. Enhance the K-12 Pipeline and its Diversity;
*** 10% of all matriculates study engineering.**
2. Promote the Success of the Undergraduate Learning Experience;
*** 3 of 4 students complete BS in engineering.**
3. Improve the Pathway to Graduate Engineering Programs for US and Permanent Residents;
*** 5000 PhDs granted to domestic students.**
4. Build a Culture of Discovery and Innovation in Engineering through Multi-Disciplinary Centers;
*** 1000 Center-related students graduate annually**



EEC Opportunities

- A) Education
- B) Human Resources
- C) Centers



Education



Program/Date

Subject

Funding

1) IEECI
(March 31, 2010)

a) G.I. Bill
b) Valley of Death

4-6 million

2) Nano Under Education
(May 7, 2010)

Nanotechnology
for
Undergraduates

2 Million

3) IEECI
(Jan, 2011)

How People Learn

4-6 million

4) IEECI
(March, 2011)

(Stay Tuned)

4-6 million



Engineering Education (1340)

- (1) Converted to Program Announcement in 2007
(Require tenured, senior Engineering Professor on Team)
- (2) Proposals received (Awards)
 - ✓ 2007 – 84 (13)
 - ✓ 2008 – 116 (40)
 - ✓ 2009 – 216 (46)
 - ✓ 2010 – (March 31, 2010)
- (3) 2010 – (Exploratory topics)
 - ✓ Valley of Death/Translation
 - ✓ Innovations for GI Pathway
- (4) 2011 – (New Announcement in September 2010-topics ?)

Building a collaborative community of scholars and practitioners



How do we bridge the divide?



Engineering education researchers

Engineering education practitioners



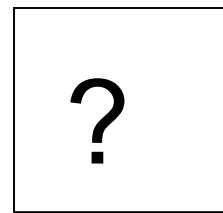


STUDENT PIPELINE



K-12

School
Board
Advisory



University

Industry
Advisory
Board



Industry



Global Experience – Purdue Pilot



- International Research and Education in Engineering (IREE)
- 50 students /(30 graduate 20 undergraduate) Summer 2010
- Shanghai research assignments
- Two week training prior to travel
 - ✓ 20 Purdue
 - ✓ 20 Shanghai
 - ✓ 10 Internet



Human Resources



Program/Date

Subject

Funding

1) REU
(August 25, 2010)

Research Experience
for Undergraduate

4 Million (New)

2) RET Research Experience 1-2 million (New)
(November 15, 2010) for teachers



Engineering REU Site Statistics



- 38 sites funded in (FY 2009); \$13.67M
- 100 active sites; impacting ~1,200 undergraduate students per year
- 34 states
- 63 institutions



RET in Engineering Site Statistics



- 61 sites funded (FY 2002-2009); \$25.4M
- 29 active sites
 - ~400 teachers per year; impacting ~80,000 students
 - 24 states
 - 29 institutions; majority large universities
- ENG supports ~60% of all NSF RETs



Centers



Program/Date

Subject

Funding

1) ERC/Spring 2011

Open
(Energy Infrastructure)

40 million/Center

2) NSECs/?

(under review)

(under review)



ERC – SBIF Partnerships (2010)



- ✓ ERC (Supplement) with Active SBIR
- ✓ SBIR (Supplement) with Active ERC
- ✓ 2010 Budget – 12 million for Innovation



RECENT EEC Workshops



- (1) Power Engineering and Education
- (2) PhD Education – Industry**
- (3) PhD Education – University Presidents**
- (4) GK-12 and Engineering
- (5) International Research in Engineering and Education Planning (Newport Declaration)**
- (6) *Healthcare and Engineering****
- (7) *K-12 and SAT/ACT Opportunity****
- (8) Engineering Design
- (9) Grand Challenges
- (10) Women in Engineering Leadership
- (11) Post-Docs in Industry**
- (12) Systems Dynamics in Forecasting Engineering Manpower needs
- (13) Planning for the GI Bill**
- (14) SBIR/ERC Grantees**
- (15) International Research Education Meeting for PIs**
- (16) Eng Ed Department Heads/Deans**



Engineering PhDs



(Some facts from CGS)

- 5 year Completion rate - (Domestic) 25%
(2008 Council of Graduate Schools Template)
 - a) require an MS ?
 - b) continuous enrollment?
- Cohort---students entering a doctoral program in a given year)
- Percent United States Citizens 31%



Overall EEC Metric for Market Penetration



Of all the 360 ABET accredited Engineering Schools,* how many did **not** submit a proposal to EEC in 2008 or 2009

22



* (85 or more graduates)





Post-Doc and Industry (2009)



- 40 Engineering Post Docs to Industry
- ASEE Clearinghouse
- 50K + 25k + benefits
- Future (?)