NSB Science and Engineering Indicators: Utilizing a Unique Data Set to Promote Economic and Workforce Development

APLU Annual Meeting Council on Research

Sunday, 13 November 2016
Parsing the Title: Important Words

- National Science Board
- Science and Engineering Indicators
- Unique Data Set
- Promote Economic Development
- Promote Workforce Development
Cross-Cutting Issues

- This session was organized jointly among 4 APLU organizations
  - Council on Research (CoR)
  - Council on Governmental Affairs (CGA)
  - Commission on Innovation, Competitiveness and Economic Prosperity
  - Commission on Information, Measurement and Analysis (CIMA)
The National Science Board

Founded in 1950 as part of NSF Act

24 Members + NSF Director

Governing and policy making body for NSF

- Develops a long-term vision for NSF
- Establishes NSF policies
- Approves the budget and extremely large projects
- Identifies and assists with issues that are critical to NSF’s mission

Serves as an independent body of advisors to both the President and Congress on broad, national policy issues related to science and engineering research and education
Science and Engineering Indicators

- Biennial report on the state of S&E in the U.S.
- Required by law; delivered to the President and Congress
- Started in 1972 as SI
- Factual and policy neutral
- Drawn from a wide variety of high quality data sources
Science and Engineering Indicators

- How it used to be....
- Hard copy tables and charts
- Detailed explanation of data and statistics
- Separate volume for data tables
- Spreadsheets and other data available online
Science and Engineering Indicators

- Now entirely “born digital” with numerous online tools
- Companion Pieces
- Interactive Infographics
- SEI Digest
- Companion Briefs
- STEM Education Resource
- Spring, 2016 stakeholder workshop
Science and Engineering Indicators

Overview of the Global S&E Landscape

Introduction

In recent years, different regional growth trends have produced dramatic shifts in the global landscape of science and engineering (S&E) research and development, education, and business activities. The result is an increasingly multipolar world for S&E, now emerging after many decades of US dominance by the United States, Western Europe, and Japan. This interactive infographic invites detailed exploration of the changing landscape of global S&E along a number of key dimensions: higher education degree production, R&D investment, high-tech R&D outsourcing and knowledge-intensive services, and public and commercial investment in clean energy. This infographic uses authoritative data and analysis from the 2016 edition of the National Science Board's Science and Engineering Indicators report.

Click Here to Begin  How to Use This Infographic
SEI Chapters

1. Elementary & Secondary Math and Science Education
2. Higher Education in Science and Engineering
4. Research and Development: National Trends and International Comparisons
5. Academic Research and Development
6. Industry, Technology and the Global Marketplace
7. Science and Technology: Public Attitudes and Understanding
8. State Indicators (Formerly Chapter 8)
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Global Context, Local Application

- Mobile Researchers
- International Collaborations
- Education
- R&D
- Internationally Mobile Students
- KTI Industries
- Global Supply Chains
- Global Trade

APLU Annual Meeting 2016
Our Panelists
Our Panelists

*Khan!!!*
Our Panelists

- Beethika Khan, Director of NSF’s SEI Program within the National Center for S&E Statistics
Our Panelists

- Rena Cotsones, Associate VP for Engagement and Innovation Partnerships at Northern Illinois University & Adjunct Professor in Department of Public Administration
Our Panelists

- Angela P. Diaz, Executive Director of Government Research Relations, UC San Diego
Some Questions

- Does SEI capture sufficient information about local, regional and national factors to inform economic development strategies (e.g., workforce availability, tax and other incentives, related industry output, quality of education)?

- How can university executive leadership, and local and state officials, use SEI as a mechanism to work more effectively together?

- NSF and other agencies are focused on BIG DATA. How can SEI be better aligned to decision maker needs?

- How can academia utilize SEI to inform, advocate for, and make its case to the new Administration?
Some Questions

- How can universities prepare their graduates for a wide range of employment opportunities? For example, doctoral students are prepared primarily for academic jobs and R&D activity. How can graduate programs prepare them for a wider range of jobs and sectors such as those in the business sector and employment abroad?

- SEI has undergone substantial transformation recently. Given the rapid evolution (and revolution) of the S&E enterprise, how can SEI best be aligned with 21st Century policy needs?
Some Questions

- How do we encourage students to make informed decisions about degree field and level and career pathways? These decisions made during secondary and postsecondary education, including undergraduate and graduate studies, have implications for subsequent employment opportunities and economic outcomes.

- Are universities contributing to economic inequality? To what extent do student populations mirror society and the overall workforce, and how has that changed over time? Some important and related questions include: what factors are important for access to a university education and successful completion of a degree program? Does student debt play a role?