

NSF Support of the Skilled Technical Workforce

Presentation to the National Science Board

May 10, 2017



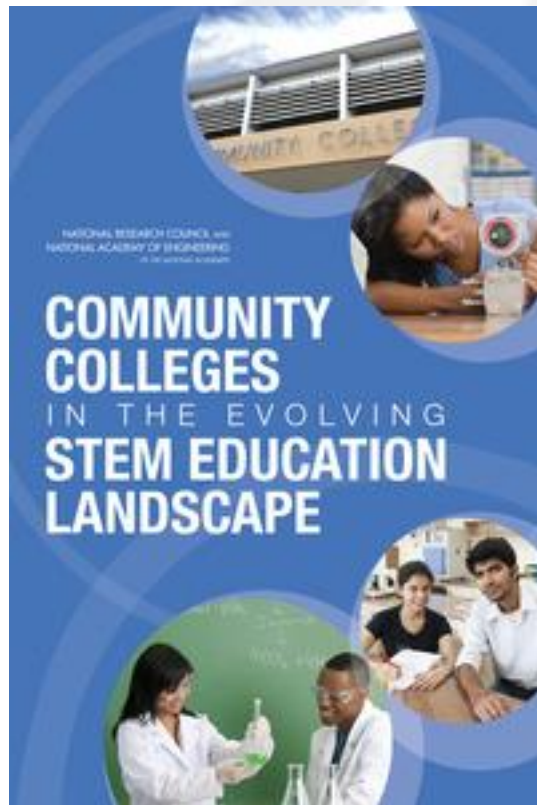
Jim Lewis, Ph.D.
EHR Acting Assistant Director

V. Celeste Carter, Ph.D.
DUE Program Director



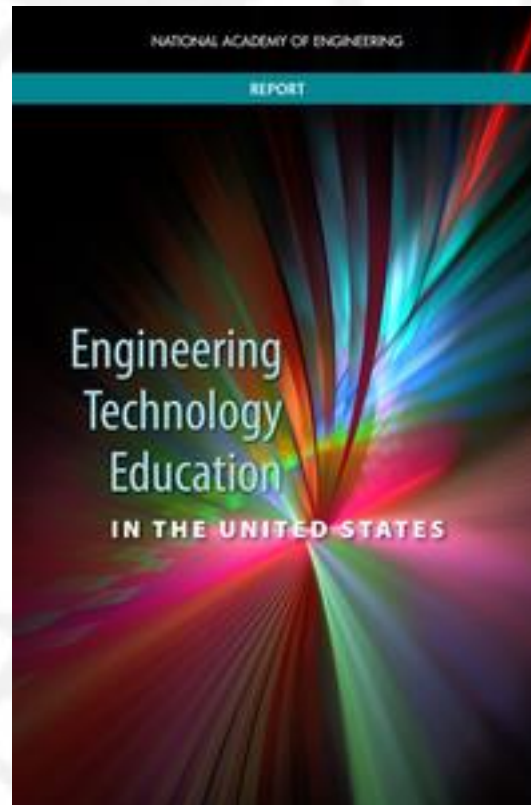
National Academy of Science Studies

DUE/ATE: 1112988



2012

DUE/ATE: 1313209



2017

DUE/ATE: 1406910

“Building America’s Skilled
Technical Workforce”

Publication date: May 18, 2017

EHR Investments

Direct Student Support

- NSF Scholarships in STEM*
- CyberCorps: Scholarships for Service

Institutional Capacity

- Tribal Colleges & Universities Program
- Improving Undergraduate STEM Education
- HSI Dear Colleague Letter

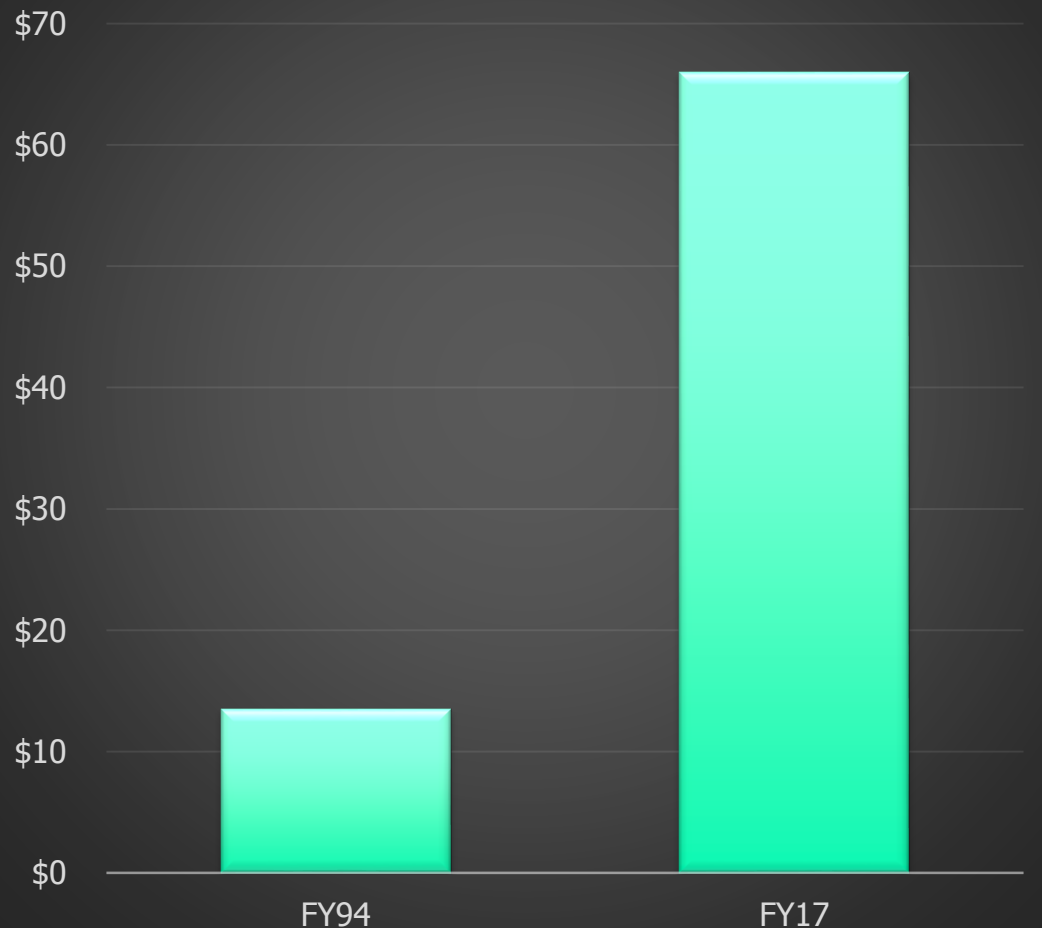
Research & Development

- Innovative Technology Experiences for Students and Teachers*
- Advancing Informal STEM Learning
- EHR Core Research

Advanced Technological Education Program

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ATE Program Budget Growth

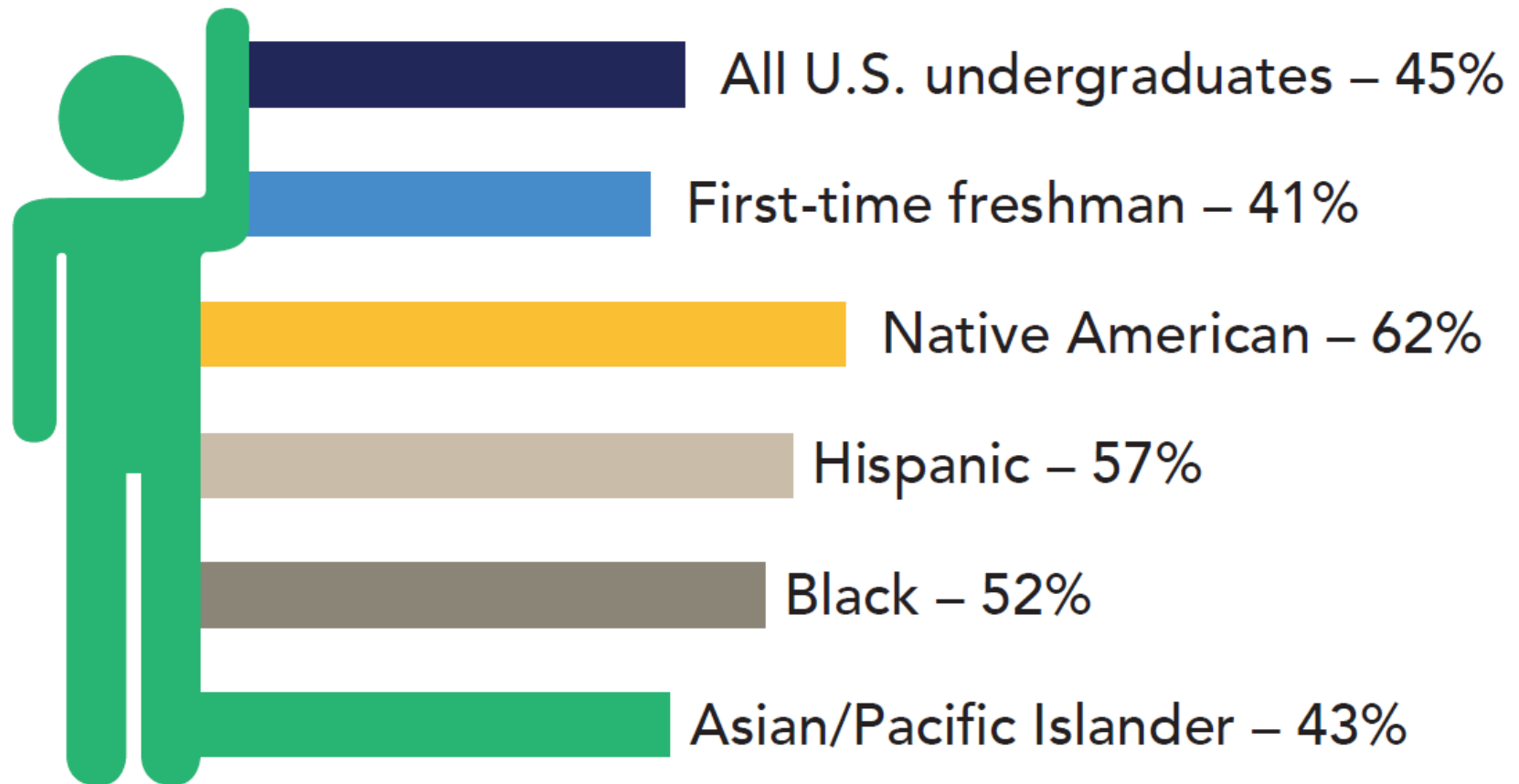


Cumulative Data (1994-2016)

- Awarded more than \$950 million
- Awards to 492 distinct institutions
- More than 65% of awards to two-year degree granting institutions.

American Association Community Colleges Fast Facts 2016

Representation of Community College Students Among Undergraduates (Fall 2014)²



American Association Community Colleges Fast Facts 2016

Other Student Demographics⁵

First generation to attend college – 36%

Single parents – 17%

Non-U.S. citizens – 7%

Veterans – 4%

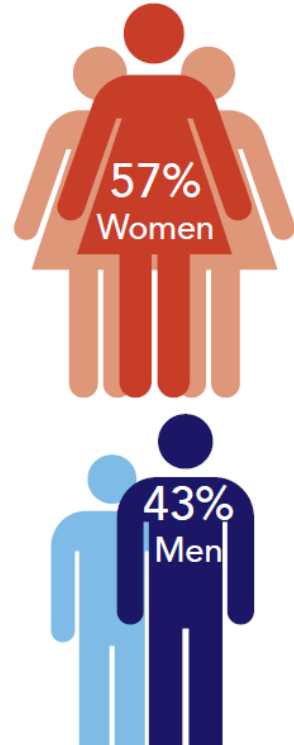
Students with disabilities – 12%

Source

1. AACC membership database, January 2016.
2. NCES. (2015). IPEDS Fall 2014 Enrollment Survey [AACC analysis].
3. AACC membership database, 2016 [AACC analysis].
4. National Student Clearinghouse. (2015). Term Enrollment Estimates Fall 2015.
5. NCES. (2015). 2011–12 National Postsecondary Student Aid Study (NPSAS:12) [AACC analysis]. Files [AACC analysis].

American Association Community Colleges Fast Facts 2016

Demographics of Students Enrolled for Credit

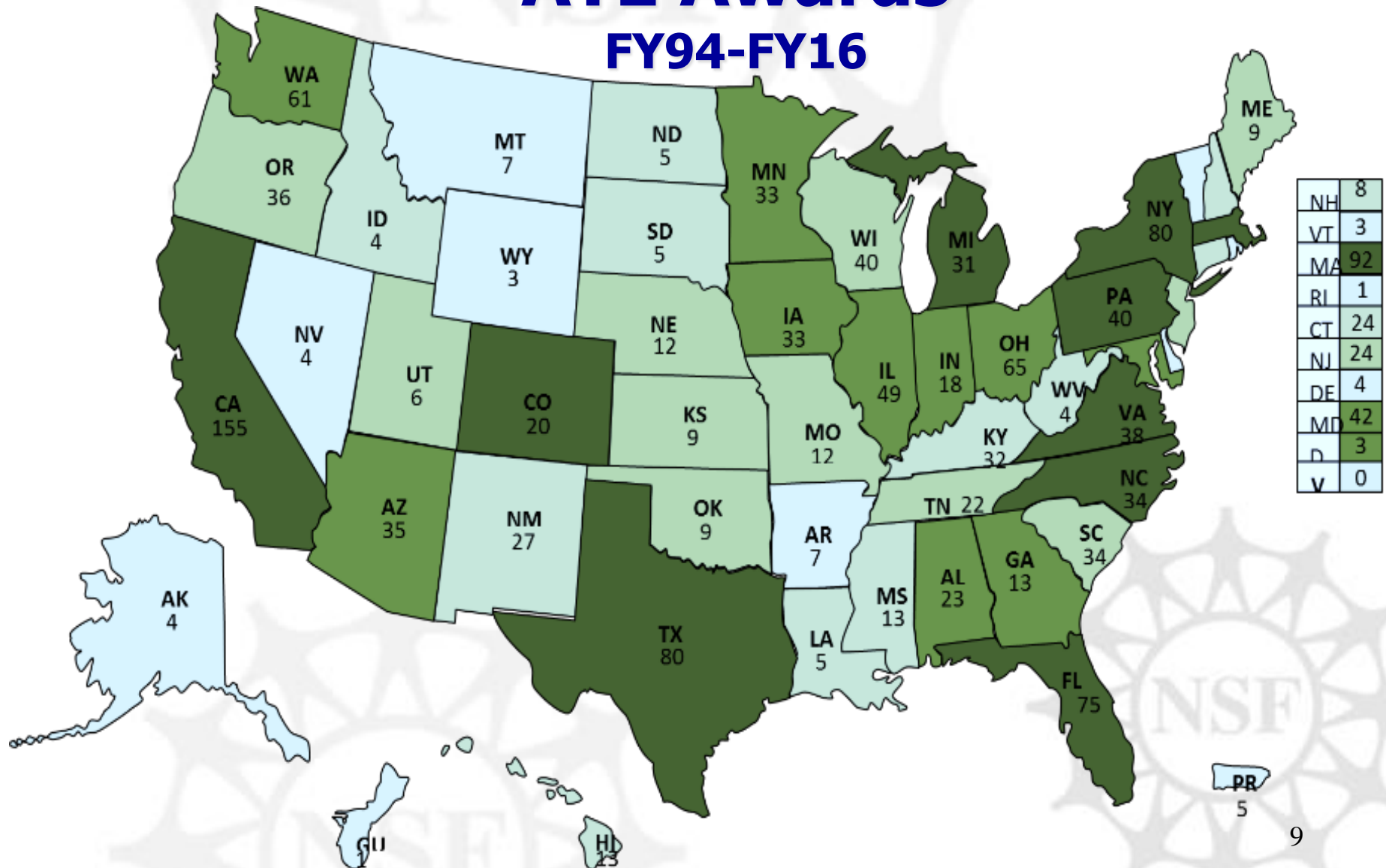
Ethnicity ²	%	Age ⁵	%	Gender ²
White	49%	Average	28	
Hispanic	22%	Median	24	
Black	14%	≤21	37%	
Asian/Pacific Islander	6%	22-39	49%	
Native American	1%	40+	14%	
Two or more races	3%			
Other/Unknown	4%			
Nonresident Alien	1%			

Scientific and Advanced Technology Act of 1992

"To establish a national advanced technician training program, utilizing the resources of the Nation's two-year associate-degree-granting colleges to expand the pool of skilled technicians in strategic advanced-technology fields, to increase the productivity of the nation's industries, and to improve the competitiveness of the United States in international trade, and for other purposes."



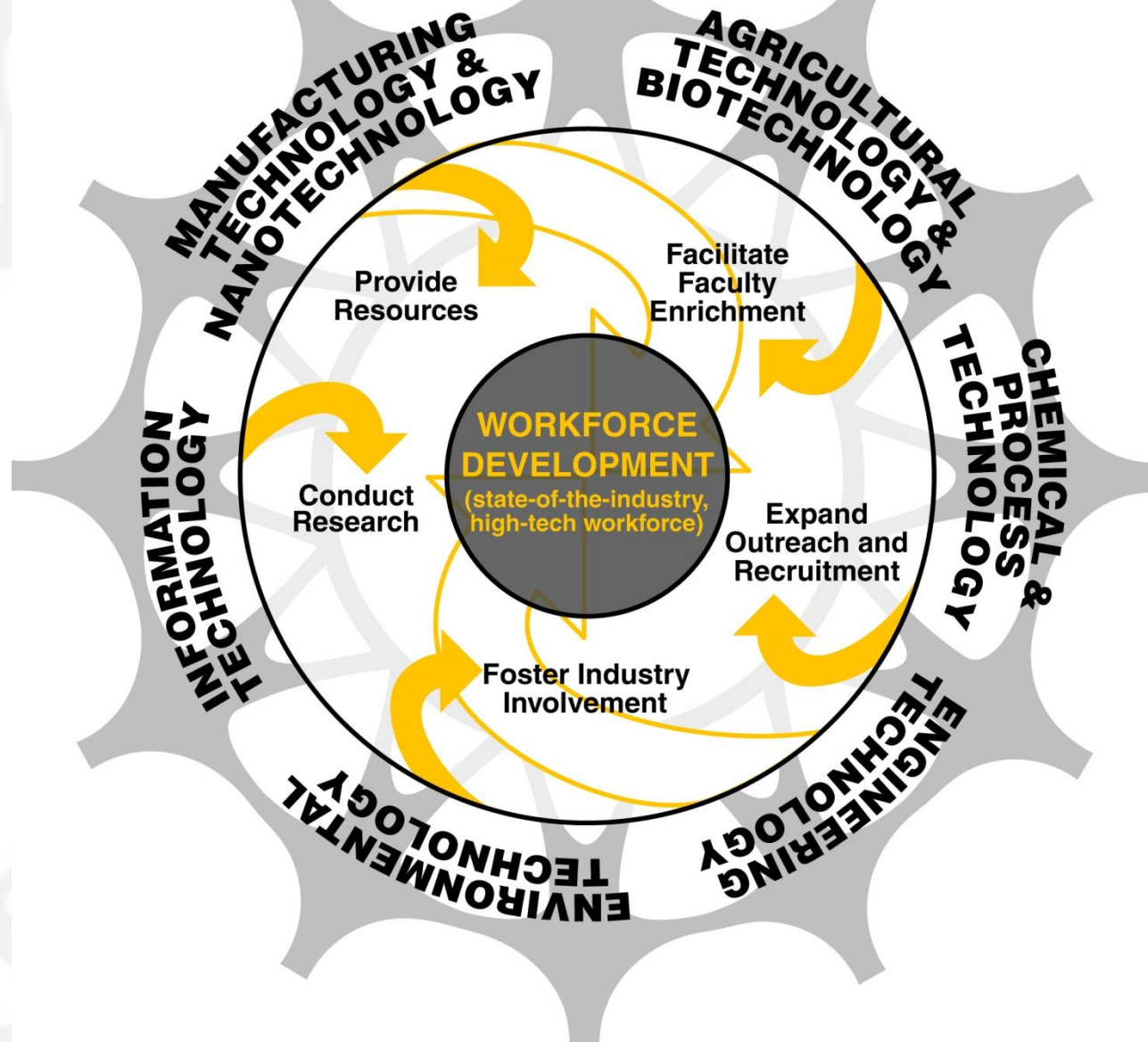
ATE Awards FY94-FY16



Advanced Technological Education (ATE) Program

- **Associate Degree Granting Institutions**
- **Science and Engineering Technician Education**
- **Partnerships:** Industry, Economic Development Agencies, Secondary schools, 4-yr Institutions
- **Pathways:** 7-12, 2- and 4-yr





ATE Supports Manufacturing USA Institutes

PCAST recommended that the federal government convene and enable industry-led, private public partnerships focused on manufacturing innovation and engaging US universities. In 2013, President Obama launched the Advanced Manufacturing Partnership 2.0 (AMP 2.0). Interagency effort initiated to support Institutes.

All funded Institutes have a workforce development plan.

How many technicians support the engineers, MS, and Ph.D. scientists in industry?

- The Lightweight Innovation for Tomorrow (LIFT) and the Advanced Composites (IACMII) Institutes are working with the ATE Materials Science Center. The ATE Center is developing an online learning hub and vetting all curricular resources on workforce development.



Community College Innovation Challenge (CCIC)

- **Who:** Teams of three to five community college students, a faculty mentor, and a community or industry partner.
- **What:** Teams propose innovative, STEM-based solutions for real-world problems they identify within one of three themes for FY17:
 - Maker to Manufacturer
 - Energy and Environment
 - Security Technologies

www.nsf.gov/CCchallenge

Carnevale, A., N. Smith, M. Melton, "STEM", Report from the Center on Education and the Workforce, Georgetown University, 2011

The vast majority of STEM jobs require some form of postsecondary education or training.

By 2018, roughly 35% of the STEM workforce will be composed of those with sub-baccalaureate training, including:

- 1 million associate degrees
- 745,000 certificates
- 760,000 industry-based certifications

<http://cew.Georgetown.edu/stem/>

Career Pathways for STEM Technicians, Dan Hull. 2012