Creating Opportunities Everywhere
NSF's Directorate for STEM Education

James L. Moore III, Assistant Director, Directorate for STEM Education (EDU)

National Science Board – Open Plenary

November 29, 2023

Directorate for STEM Education Mission

Develop a **well-informed citizenry** and a **diverse and well-prepared workforce** of scientists, technicians, engineers, mathematicians and STEM educators.

EDU supports excellence in STEM education at ***all*** levels and settings.

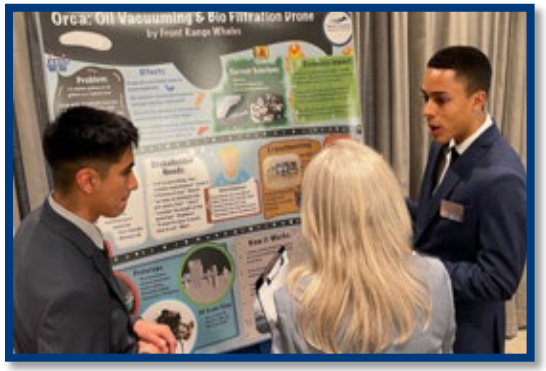
Office of the Assistant Director (OAD)

Division of Research on Learning in Formal and Informal Settings (DRL)

Division of Undergraduate Education (DUE)

Division of Graduate Education (DGE)

Division of Equity for Excellence in STEM (EES)



EDU's Priorities

Education and Learning Research

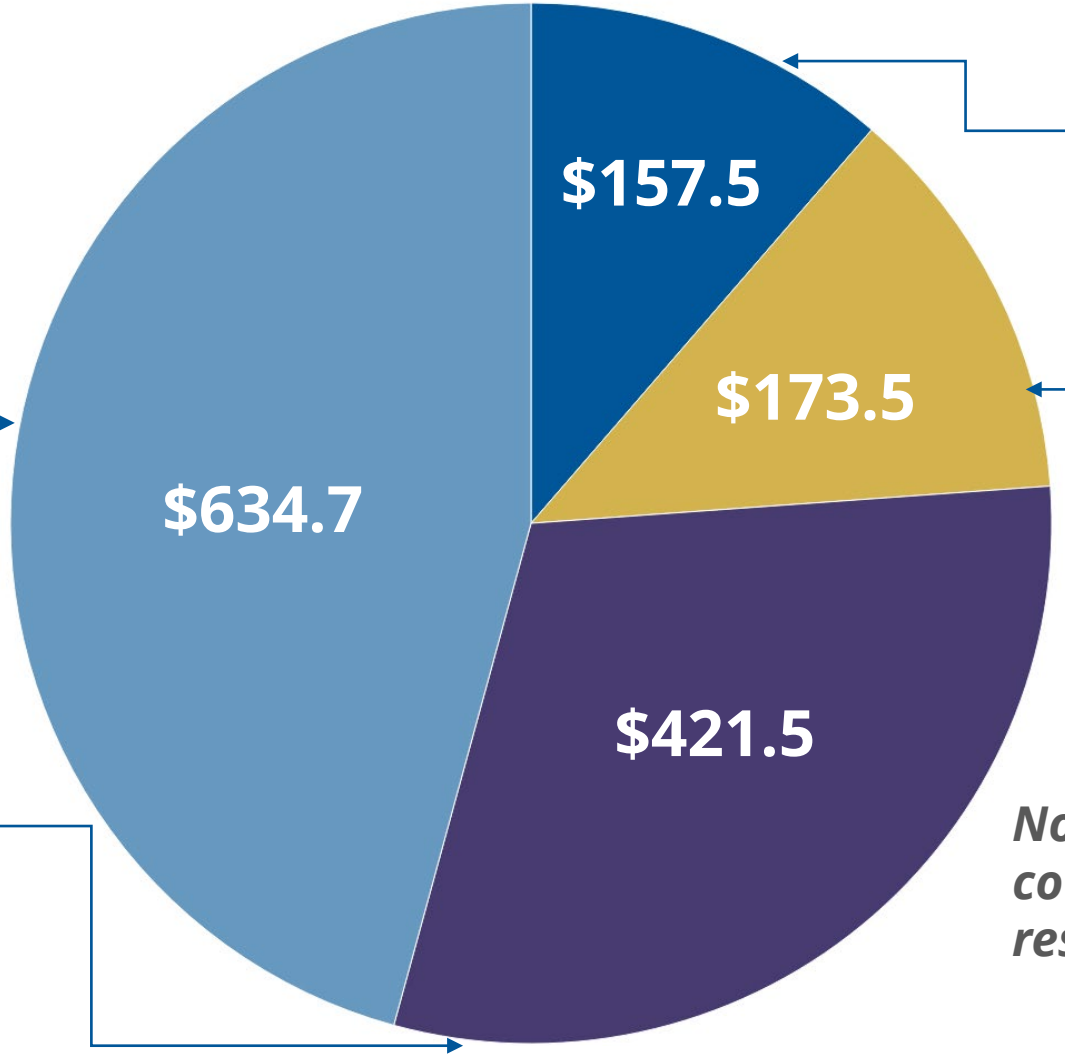
Learning and Learning Environments (Formal and Informal)

Broadening Participation and Institutional Capacity

Scholarships/Fellowships and Professional Workforce Development

EDU's STEM Education Program Investments (FY 2022)

Dollars in Millions; Co-STEM Inventory



K-12 STEM Education Programs

Outreach and Informal STEM Education Programs

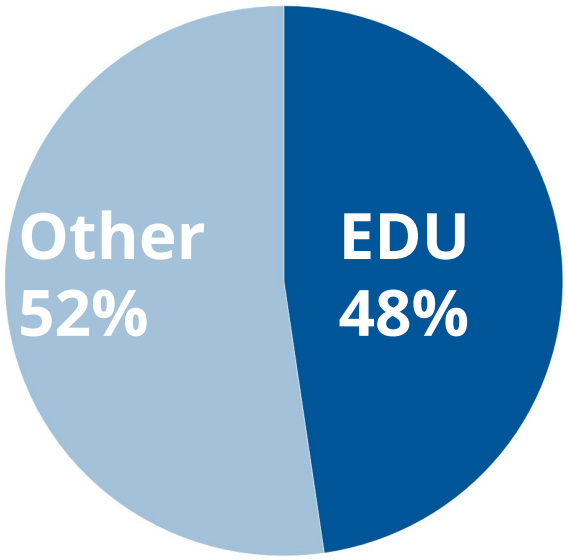
Undergraduate STEM Education Programs

Graduate and Professional STEM Education Programs

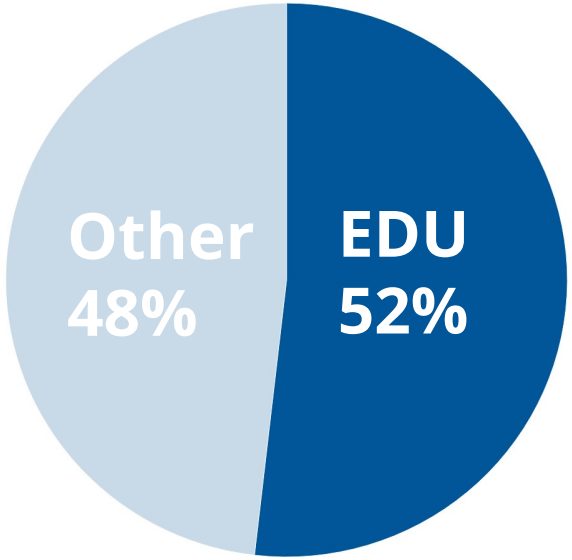
Not included in this count are students on research grants.

EDU Awards FY 2011-2023 – *NSF By the Numbers*

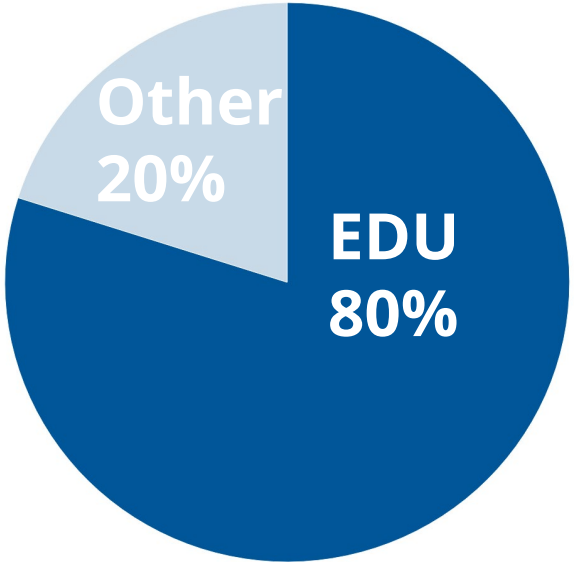
EPSCoR STATES
Bachelor's & Two-Year



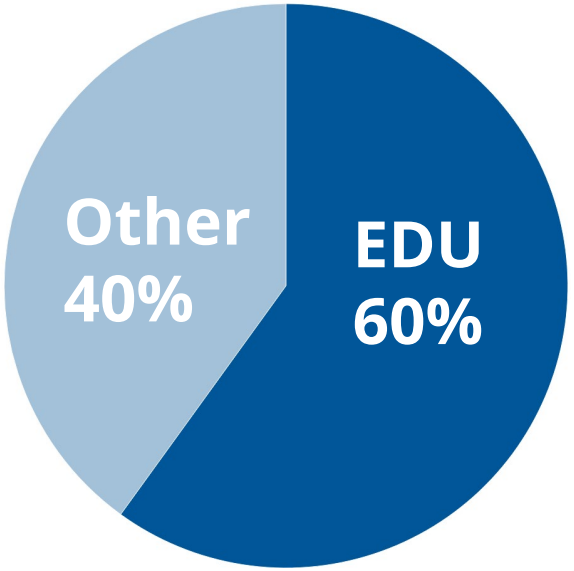
Historically Black Colleges and Universities



Tribal Colleges



Hispanic-Serving Institutions
Bachelor's & Two-Year



The Grand Challenges in STEM

How do we ensure equitable access?

How do we recruit, prepare, and retain students?

How do we improve learning outcomes and participation?

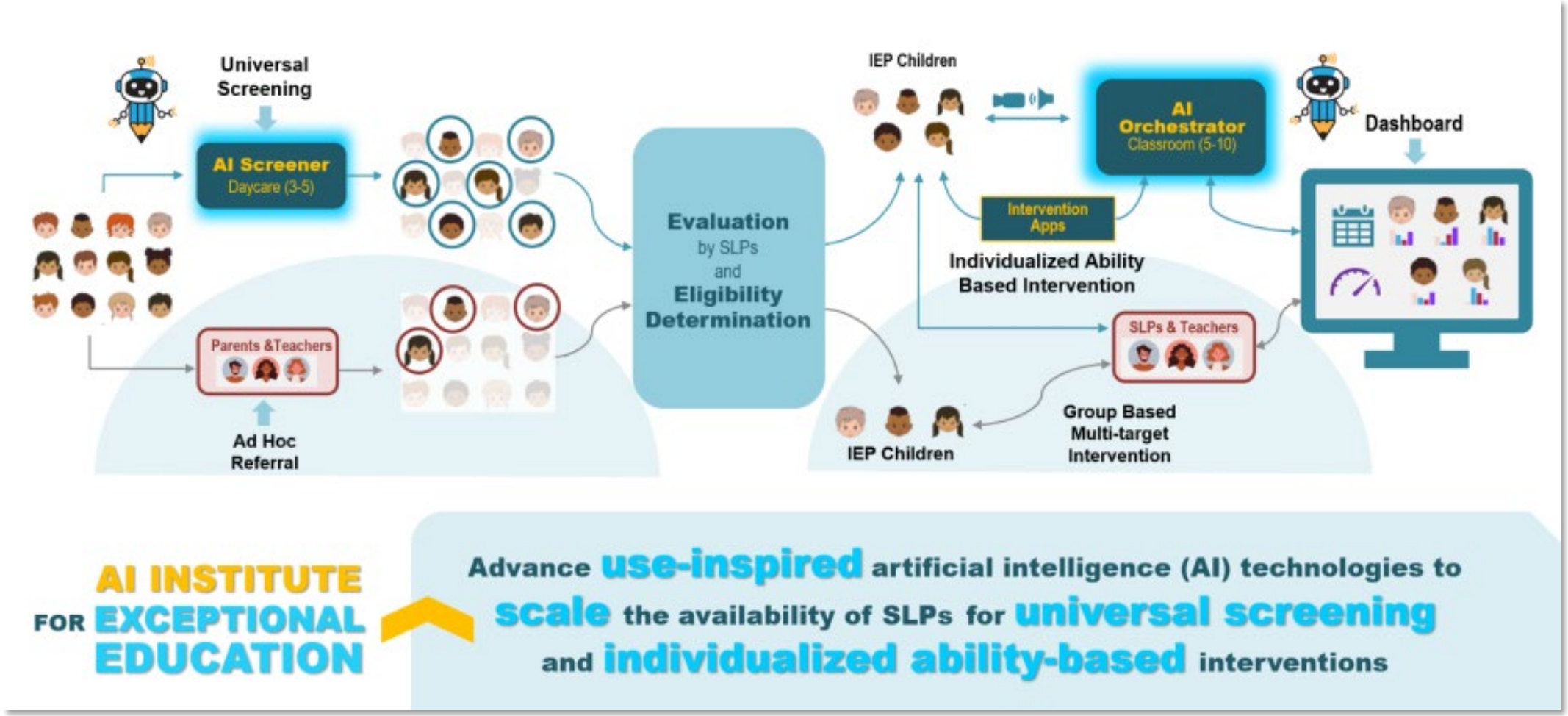
How do we build capacity?

Ensuring Equitable Access to STEM

- EDU funded the project “Cultivating Research and Equity for Sign-related technology” (CREST).
- CREST provides new opportunities for deaf students and researchers to grow their professional networks. It increases visibility. It offers new pedagogy to improve experience of deaf individuals.

Ensuring Equitable Access to STEM

National AI Institute for Exceptional Education



AI INSTITUTE FOR EXCEPTIONAL EDUCATION

Advance **use-inspired** artificial intelligence (AI) technologies to **scale** the availability of SLPs for **universal screening** and **individualized ability-based** interventions

Supporting Recruitment, Preparation, and Retention

Scholarships in STEM (S-STEM)

- Academically talented low-income students
- ~100,000 scholars since 2004
- 644 active awards
- 209 at MSIs
- 138 in EPSCOR states

Supporting Recruitment, Preparation, and Retention

"GRFP is providing me the opportunity not only to pursue graduate education to deepen my area of study but also to dedicate a life toward increasing representation and engagement in my field."

Andre Green, fourth from left, 2023 GRFP recipient.

Improving STEM Learning Outcomes

- EDU-funded researchers found that active learning leads to better grades and understanding of calculus compared to lecture-based classes.
- Improved teaching methods help graduate more STEM professionals.

Improving STEM Learning Outcomes

NSF 23-078

Dear Colleague Letter: Supporting Knowledge Mobilization for PreK-12 and Informal STEM Learning and Teaching

March 31, 2023

Dear Colleagues:

The National Science Foundation (NSF) supports collaborations and partnerships among education researchers and practitioners to advance science, technology, engineering and mathematics (STEM) education for all Americans. Such collaborations address pressing needs in the Nation's diverse preK-12 schools, including students, teachers, and families, as well as informal learning institutions where professional educators, youth, and their families are engaged (e.g., science museums, media, and community organizations). Recent findings and recommendations by National Academies of Science, Engineering, and Medicine have highlighted the benefits of mobilizing relevant knowledge between the education research and practice communities.

Building Institutional Capacity

Above: NRT researchers at University of Hawaii; project "Data in Engineering and Society: Converging Applications, Research, and Training Enhancements for Students"

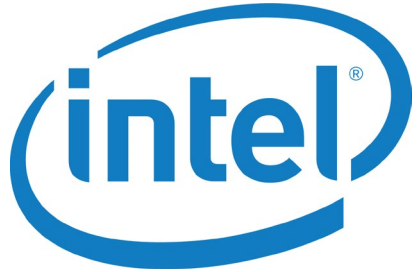
- NRT's nearly $63 million investment reaches 45 states, the District of Columbia and the U.S. Virgin Islands.

Building Institutional Capacity at MSIs

Builds on the assets of the country's two-year colleges and invests in their futures.

Improves research support and service capacity at emerging research institutions.

The Importance of Partnerships:
Cross-agency, Cross-federal, and External Collaborations



EDU – Now and Looking Ahead

Number of People Involved in NSF Activities

*Does not include estimates for people funded through the American Rescue Plan supplemental appropriation.

Group	FY 2022 Actual Estimate*	FY 2023 Base Estimate
Senior Researchers	52,747	55,430
Other Professionals	13,473	14,300
Postdoctoral Associates	6,062	6,430
Graduate Students	43,615	45,530
Undergraduate Students	39,241	39,960
K-12 Teachers	41,862	42,200
K-12 Students	139,070	148,000
Total Number of People	336,070	351,850

Class Focus: Antarctica and Emperor Penguins
English: penguin
Spanish: pingüino
Yaghan: lula
Read:
• Daddy Penguins
• Orca whales in Antarctica
• Scientists in Antarctica
Write:
ENTERING
PINE RIDGE
INDIAN RESERVATION
JET

NSF
NATIONAL SCIENCE BOARD
NSB