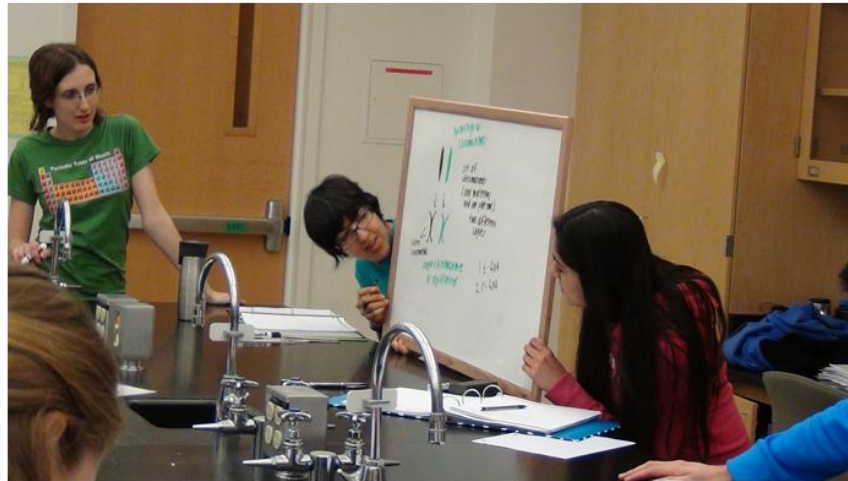# Association of American Universities

AAU Undergraduate STEM Education Initiative

Jim Fairweather, Co-PI AAU Undergraduate STEM Education Initiative
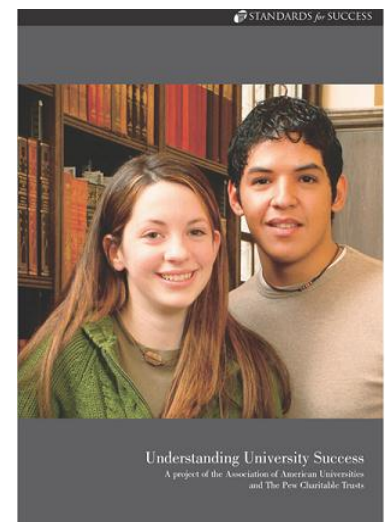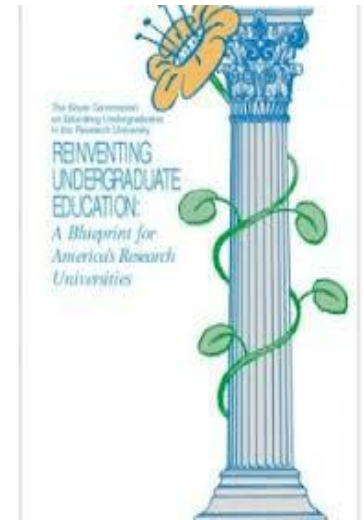Emily Miller, Project Director AAU STEM Initiative

Transforming Institutions Conference | October 24, 2014

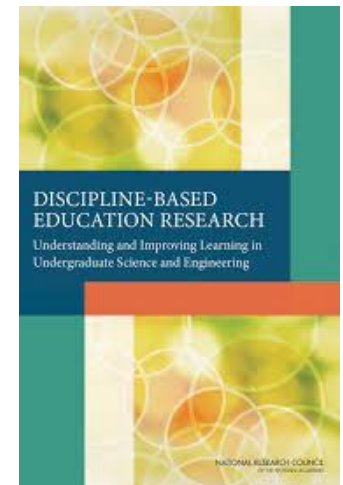# Welcome

- ☐ Introductions

- ☐ Structure of Session

History

- Boyer Commission Report (1998)
- AAU response
  - Undergraduate Research Pilot Study (2001)
  - Standards for Success (2003)
- Informal survey of programs at AAU Universities (2009)

Motivation: AAU STEM Initiative

- AAU Leadership
- Significant pressures for increased assessment and accountability at the federal and state level
- Research base on how people learn and effective teaching methods
- Focus on implementation

REPORT TO THE PRESIDENT
ENGAGE TO EXCEL: PRODUCING ONE MILLION ADDITIONAL COLLEGE GRADUATES WITH DEGREES IN SCIENCE, TECHNOLOGY, ENGINEERING, AND MATHEMATICS

Executive Office of the President
President's Council of Advisors on Science and Technology

FEBRUARY 2012

DISCIPLINE-BASED EDUCATION RESEARCH
Understanding and Improving Learning in Undergraduate Science and Engineering

NATIONAL RESEARCH COUNCIL

Objective of AAU STEM Initiative

The overall objective of AAU's Undergraduate STEM Education Initiative is to influence the culture of STEM departments at AAU universities so that faculty members are encouraged and supported to use teaching practices proven by research to be effective in engaging student in STEM education and in helping students learn.

Key Components of AAU STEM Initiative

"AAU is not conducting another study or research project on STEM education. We are moving to implement the results of the latest research into science and math pedagogy."
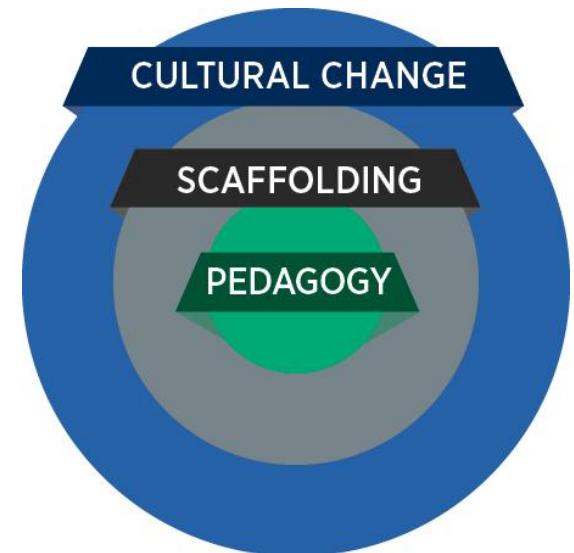
Hunter Rawlings, AAU President

- **Framework (Goal #1)**
  - Develop a framework of evidence-based practices that can be used to improve STEM teaching and to measure these improvements
- **AAU STEM Projects & AAU STEM Network (Goal #2)**
  - Identify a subset of AAU institutions that will serve as projects sites to implement the framework
  - Find ways to engage all of our members
- **Incentives (Goals #3 and #4)**
  - Explore institutional and departmental incentives for good teaching
  - Work with federal agencies on mechanisms to encourage good teaching
- **Promising Practices (Goal #5)**
  - Develop effective means for sharing information about effective undergrad STEM programs, approaches, and methods for evaluating teaching

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RESEARCH CORPORATION
for SCIENCE ADVANCEMENT
A foundation dedicated to science since 1912.

The Role of Theory in the AAU Initiative: Looking Beyond the Classroom

The Framework provides a set of key institutional elements that need to be addressed in order to bring about sustainable change.

- Faculty Members

- Department Chairs

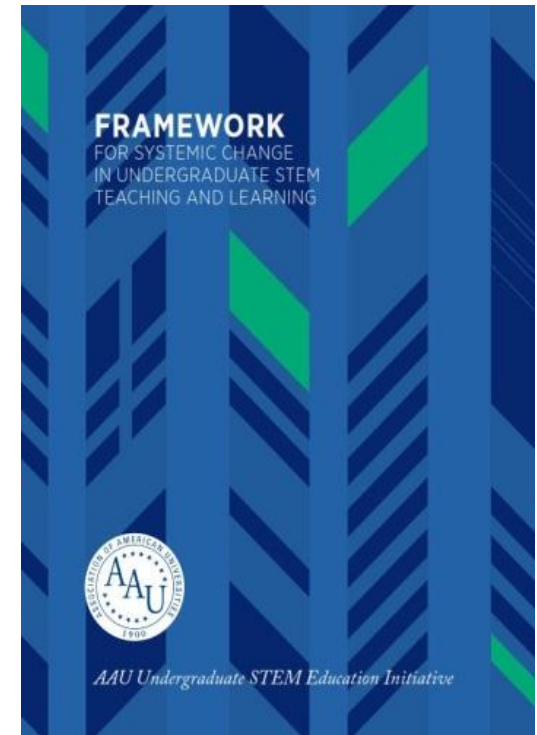- College & University Administrators

- Institutions

Lessons Learned by AAU

Framework

- Defined a niche focus
- Engaging AAU member institutions in refining the Framework generated buy-in

42 of our 62 institutions responded
21 public, 19 private, 2 Canadian

AAU STEM Project Sites

AAU STEM Network

The AAU STEM Network is a collaborative network that helps to support and link AAU institutions committed to addressing the institutional and cultural barriers to reforming undergraduate STEM teaching and learning.

www.aau.edu/STEM

#AAUSTEM

Metrics & Evaluation

- Developing common measures across campuses is *difficult*
  - an iterative process helps generate buy-in.
- Communication is key
  - Faculty and administrators think very differently about data than a national higher ed organization.
- Connections between evaluation efforts (e.g., baseline data, project site annual reports, and campus site visits) must be made clear.
- Common metrics are important, but …
  - For some things they may not make sense.
  - It's still important to have individual campuses performing evaluation of those things.

Collaborations

- Awareness of fellow national projects working to achieve similar aims
  - Mapping the space and tracking activity on campuses
  - Coalition for Reform of Undergraduate STEM Education
- Role as a convener

Key Success Elements … we think?

- Right timing
- Focus of Initiative and sequence of activities
- Importance of giving credibility to undergraduate STEM educational reform efforts
- Integration of grants and activities
- Leveraging competition and fostering connections through the AAU STEM Network
- Sharing early results