

# The Use of Super Groups to Support AAU and the STEM Undergraduate Education Initiative



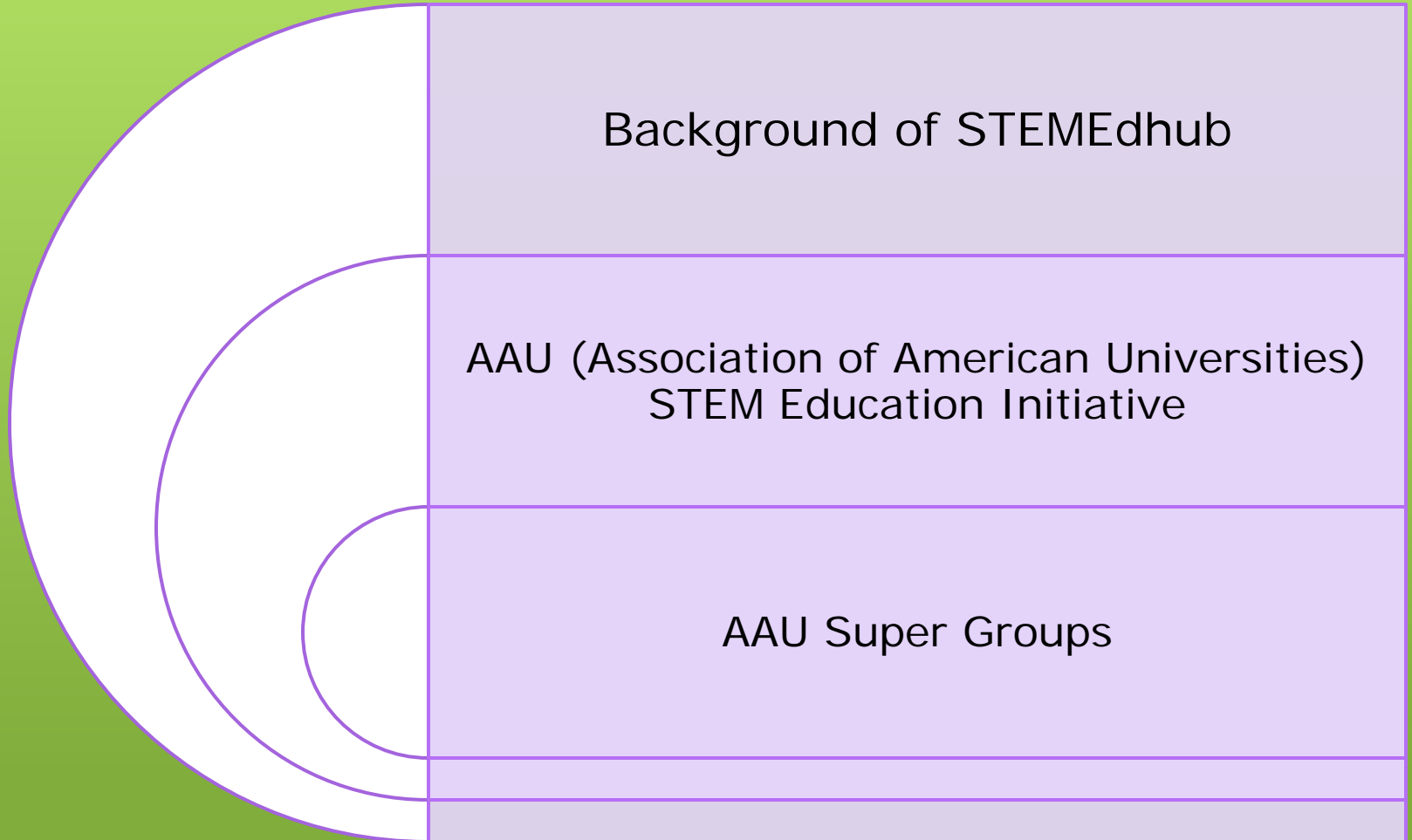
Hubbub 2014

Ann Bessenbacher

Discovery Learning Research  
Center

Purdue University

# Overview



# Background of STEMEdhub

- Created April 2011
- Shared project/group funding model
- Participants register and participate for free
- One hub manager with many group administrators
- Users: Education Researchers, K-12 Educators, Public

# Background of STEMEdhub



The screenshot shows the homepage of STEMEdhub. At the top left is the logo for "SIEMEd hub" with the tagline "Transforming Education: From Innovation to Implementation". To the right is a search bar and "Login" and "Register" buttons. Below the header is a navigation menu with links for Home, Groups, Collections, Resources, Members, Explore, About, and Support. The main content area features a "WELCOME TO STEMEDHUB.ORG" section with a description of the site's focus on STEM-related disciplines. To the right is a "Featured Collaborators" section highlighting "SLEDhub" and "AAU". Below this is a "UPCOMING EVENTS" section listing the "HUBBUB The Hubzero Conference" and "2014 Transforming Institutions 21st Century Undergraduate STEM Education". On the right side of the page is a "FIND CONTENT BY TAGS" section with a search bar and a list of popular tags such as "sled", "teacher reflection", "grade 5", "Conference", "grade 6", "WOC", "HBCU", "RGS", "reflection", "K-12", "lesson plan", "sled summer institute", "grade 4", "2014", "powerpoint", "PBL", "summer institute", "CASPIE", "prosthetic leg", "candy bag", "slow boat", "video", "SLED Teacher Reflection", "grade 3", "musical instrument", and "More tags".

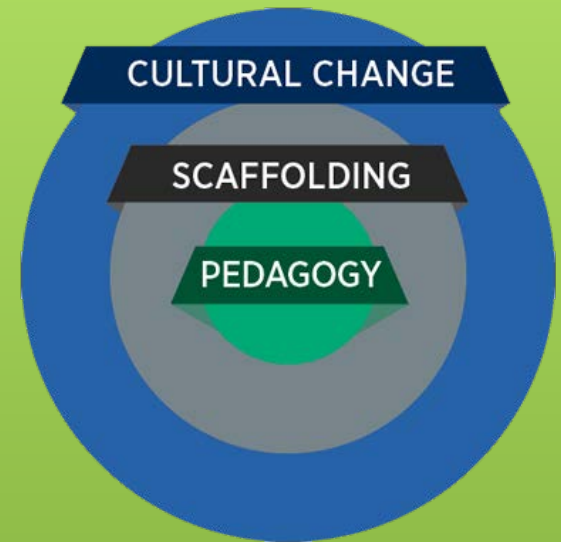
# AAU Association of American Universities

- AAU is a nonprofit organization of 62 member universities in the US and Canada
- Launched a 5 year initiative to improve the quality of undergraduate STEM Education
- Effort is based on existing research to influence the culture of STEM departments at AAU universities focused on first-year and sophomore levels

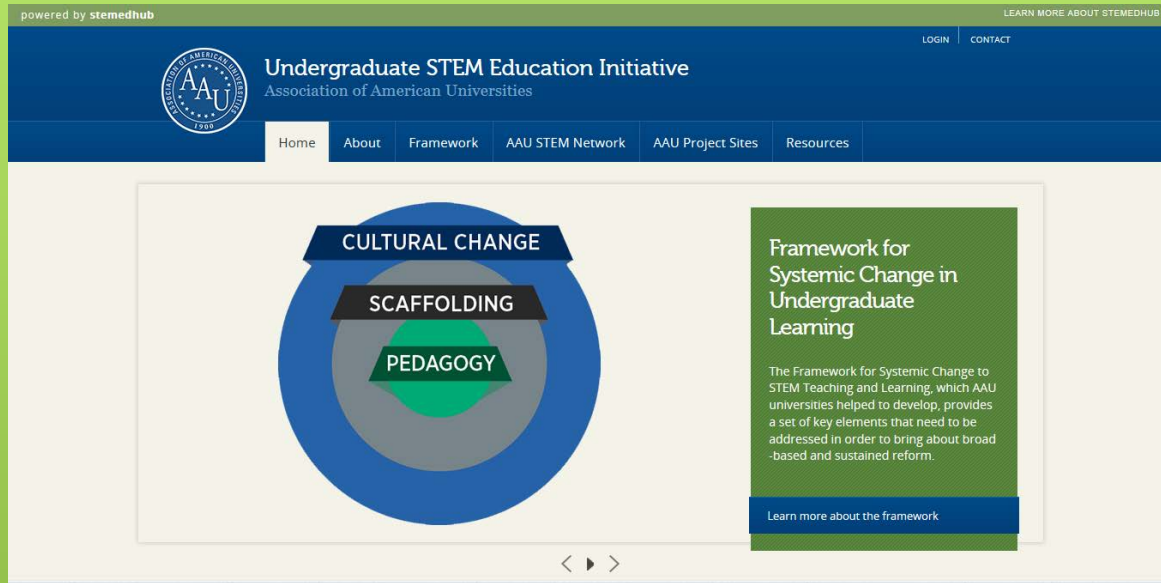


# Goals of AAU's STEM Education Initiative

1. Develop an effective analytical framework for assessing and improving the quality of STEM teaching and learning
2. Support AAU STEM project sites – 8 seed funded laboratories
3. Explore means that institutions and departments can use to improve STEM teaching and learning
4. Work with federal research agencies to develop means of recognizing, rewarding, and promoting efforts to improve undergraduate learning
5. Develop effective means for sharing information



# AAU Group



- Serve as a collaboration network of STEM Education Researchers
- Showcase examples of innovative institutional efforts from both project sites and other member sites
- Sustain dialogues on systemic change across AAU member campuses

# AAU Group


- Main group at <http://www.aau.edu/stem>
- Designed to coordinate in colors with both the AAU website and STEMEdhub
- Simple navigation menu: Home – About – Framework -AAU STEM Network – AAU Project Sites – Resources
- Repeated slider designs on three pages that both myself and the AAU staff can update and manage
- Embedded videos, data chart slider, and twitter feed



# AAU Group – Home Page

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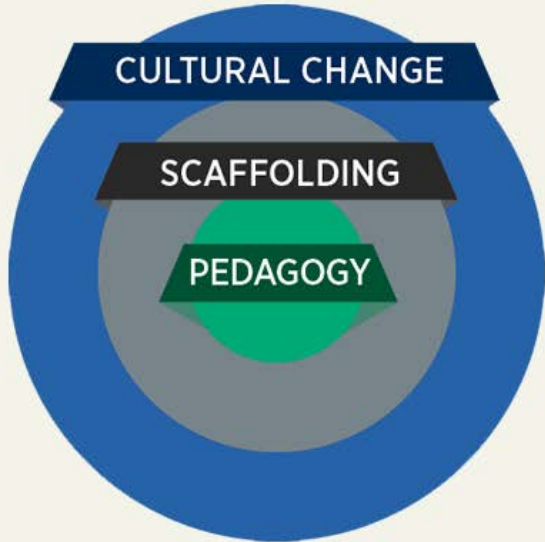
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## Undergraduate STEM Education Initiative

Association of American Universities

- Home
- About
- Framework
- AAU STEM Network
- AAU Project Sites
- Resources



**CULTURAL CHANGE**

**SCAFFOLDING**

**PEDAGOGY**

### Framework for Systemic Change in Undergraduate Learning

The Framework for Systemic Change in Undergraduate STEM Teaching and Learning, which AAU universities helped to develop, provides a set of key elements that need to be addressed in order to bring about broad-based and sustained reform.

[Learn more about the framework](#)

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# AAU Group –Home Page Cont'd

## AAU STEM Initiative

AAU has launched a five-year initiative in collaboration with our member universities to improve the quality of undergraduate teaching and learning in science, technology, engineering, and mathematics (STEM) fields. This is not another study or research project on STEM education. Instead, it is an effort based on overwhelming existing research to influence the culture of STEM departments at AAU universities so that faculty members are encouraged to use student-centered, evidence-based, active learning pedagogy in their classes, particularly at the first-year and sophomore levels.



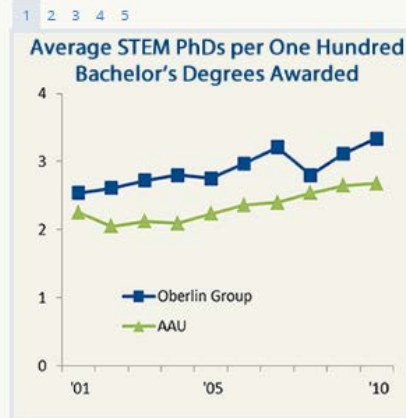
## Join the initiative

Join the AAU STEM Network! The network enables faculty members and administrators at AAU Institutions to share successful strategies that promote scalable and sustainable change in undergraduate STEM teaching and learning. All AAU institutions are welcome.

[Join group discussions](#)

[Connect with other members](#)

## Data gallery





■ OCTOBER 23, 2014 @ 8:00 AM - OCTOBER 24, 2014 @ 4:00 AM

## Transforming Institutions

This conference will focus on transforming undergraduate STEM education, especially intended for academic leaders and education researchers and the institutionalization of research-based transformative practices. FEATURING: -Dr. Freeman Hrabowski, III, President of the University of Maryland, Baltimore County -Dr. Adrianna Kezar, Professor of Higher Education, University of Southern California -Dr. Linda Slakey, Consultant, AAU STEM Initiative -Mr. Howard Gobstein, SMTI Co-Director and the Executive Vice President for Research, Innovation and STEM Education at APL

## #aaustem

-  **AAU** @AAUniversities  
U.S. #universities are reimagining teaching & learning, writes @UNC @ChancellorFolt; #AAUSTEM; usnews.com/news/college-o...  
Retweeted by Lisa Romero  
[Show Summary](#) 23 Sep
-  **AAU** @AAUniversities  
U.S. #universities are reimagining teaching & learning, writes @UNC @ChancellorFolt; #AAUSTEM; usnews.com/news/college-o... 23 Sep

# AAU Group Framework

## Framework Elements



Make a selection to see the results.

# AAU Group Framework Filters

## Framework Elements

The screenshot displays the 'Framework Elements' section of the AAU Group Framework Filters. It features a grid of four elements: 'Faculty Professional Development' (grey), 'Educational Practices' (green), 'Leadership Commitment' (blue), and 'College Demographics' (white). To the right of the grid is a list of filters with checkboxes and expand/collapse symbols. The filters are: Geographic Region (with sub-options: Far West, Great Lakes, Mid East, New England, Plains, Rocky Mountains, Southeast, Southwest), Public/Private, Total Enrollment, Total Undergraduate Enrollment, Academic Discipline, Intervention Focus, Intervention Type, and Student Target Population (with sub-options: First Generation Students, Minority Students, Women, Persons with disabilities, N/A).

Framework Element	Color
Faculty Professional Development	Grey
Educational Practices	Green
Leadership Commitment	Blue
College Demographics	White

**College Demographics:**

**Geographic Region:** -

- Far West
- Great Lakes
- Mid East
- New England
- Plains
- Rocky Mountains
- Southeast
- Southwest

**Public/Private:** +

**Total Enrollment:** +

**Total Undergraduate Enrollment:** +

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**Academic Discipline:** +

**Intervention Focus:** +

**Intervention Type:** +

**Student Target Population:** -

- First Generation Students
- Minority Students
- Women
- Persons with disabilities
- N/A

Make a selection to see the results.

# AAU Framework Efforts

## Changing the Culture of Introductory Science

*Institution:* Brown University

*Summary:* We seek to introduce evidence-based, high impact practices in first and second year STEM courses at Brown University with a primary focus on improving the mathematical competency among...

+ MORE

## Cornell University Physics Initiative in Deliberative Practice (CUPID)

*Institution:* Cornell University

*Summary:* In addition to a substantial initiative in the undergraduate biology major program, Cornell University is also working to restructure the core course sequences for engineering and...

+ MORE

## Accelerating Assessment Skills and Understanding for Future Faculty in Sciences and Humanities

*Institution:* Cornell University

*Summary:* Cornell University is undertaking campus-wide and discipline-specific initiatives to provide graduate students and postdoctoral scholars with practical experience in planning for,...

+ MORE

## Graduate Research in Teaching Fellowship Program

*Institution:* Cornell University

*Summary:* The Graduate Research and Teaching Fellowship Program (GTRF) at Cornell University provides graduate students considering academic positions in higher education with opportunities...

+ MORE

# AAU STEM Network Page

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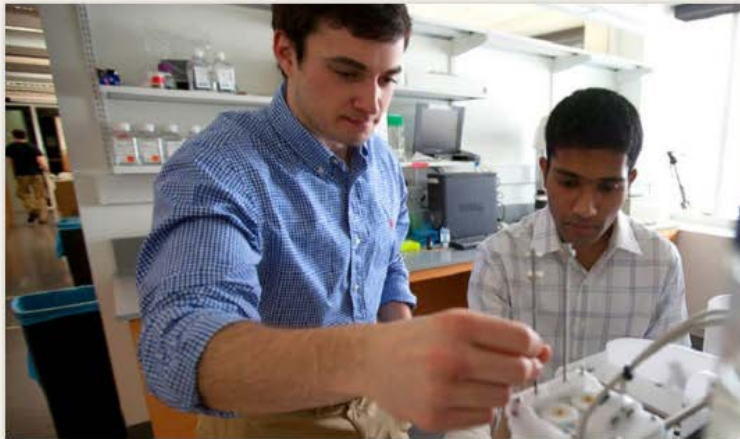
About

Framework

AAU STEM Network

AAU Project Sites

Resources



## Fundamental Pedagogical Changes in the Core Biology Curriculum

Cornell University has initiated institution-wide changes to the core undergraduate biology curriculum to transition from traditional lecture based instruction to incorporation of active learning techniques. The first phase of this five-year transition will focus ...

[Find out more here](#)



## AAU STEM Network

Several AAU universities are already at the forefront of addressing the institutional and cultural barriers to reforming undergraduate STEM teaching and learning. The AAU STEM Network includes AAU institutions committed to developing or expanding campus efforts that address the core elements of the [Framework for Systemic Change in Undergraduate STEM Teaching and Learning](#).

"There is an urgent need to address the institutional and cultural barriers that keep faculty members from adopting the best teaching practices in their classrooms."

— Hunter R. Rawlings III

# AAU Project Sites Page

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## A Multi-Strategy Approach to Active Learning

The primary focus of this project addresses scaffolding and support for Washington University STEM faculty with an explicit professional-development component. The goals ...

Washington University of St. Louis

## STEM Education Reforms in Action


AAU selected and seed funded a subset of AAU member universities to serve as project sites for the AAU's STEM Initiative. The eight project sites serve as laboratories to implement the Framework and are advancing projects designed to encourage STEM departments to adopt proven, evidence-based teaching practices.

THE LEONA M. AND HARRY B.  
**HELMSLEY**  
CHARITABLE TRUST

*Project Sites are supported through a grant from  
The Leona M. and Harry B. Helmsley Charitable Trust*

# AAU Resources

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## AAU Library

### AAU Documents

- [AAU Conference Poster Session July 21, 2014](#)
- [AAU STEM Conference Program July 21-23, 2014](#)
- [Poster Session Program July 21, 2014](#)
- [Framework for Systematic Change In Undergraduate STEM Teaching and Learning](#)
- [Advisory Committee Members](#)
- [Matrix of National STEM Undergraduate Education Initiatives](#)
- [AAU Undergraduate STEM Education Initiative-Two-page Summary](#)
- [AAU Undergraduate STEM Education Initiative-Discussion Draft](#)

### Press Releases

- [AAU Receives NSF Grant to Study how AAU STEM Teaching Initiative Produces Educational Change at Member Campuses](#)
- [AAU Launches Website for STEM Education Initiative, Announces University STEM Network Conference](#)
- [AAU Selects Eight Campus Project Sites for Undergraduate STEM Education Initiative \(official press release\)](#)
- [Brown Is a Project Site for AAU STEM Effort](#)
- [MSU Part of a National Effort to Improve Science, Math Education](#)
- [UA One of Only Eight Institutions Selected for Nationwide STEM Initiative](#)
- [UC Davis Awarded \\$500,000 to Improve STEM Teaching](#)
- [UNC Tapped for National AAU Project to Transform STEM Education](#)
- [CU-Boulder Selected to Be One of Eight Sites for National STEM Education Initiative](#)
- [Penn to Implement AAU Undergraduate STEM Education Initiative](#)
- [AAU Selects Washington University in St. Louis As One of Eight Project Sites](#)
- [Grant from NSF Boosts AAU Undergraduate STEM Education Initiative](#)

[https://stemedhub.org/groups/aau/File:AAU\\_Framework\\_040714.pdf](https://stemedhub.org/groups/aau/File:AAU_Framework_040714.pdf) Education Initiative



# AAU Group Members

- AAU Project Sites were required to participate in the AAU group as a part of their seed funding.
- AAU Member Institution points of contact were invited to join the AAU group as well as all AAU Conference Participants
- Points of contact are made managers of their individual institution groups, invite members to join their group and those participants are made members of the AAU group.

# AAU Institution Super Groups

The collage displays several institutional websites with the following content:

- University of Wisconsin-Madison:**
  - Section: **DELTA Research Learning**. Text: "The University of Wisconsin-Madison is the leader in the research and learning initiative for Science Education Research Center Sloan Foundation." Includes a "Check out the effort" button.
  - Section: **University of Wisconsin-Madison**. Text: "Educational Innovation empowers faculty and staff to be the agents of change for the University of Wisconsin-Madison. The inherent creativity of our world-class faculty and staff will be the spark for innovative approaches to curriculum and research, and set the university on the path to greater self-sufficiency. This coordinated effort will create a sustained campus environment that maintains and enhances student learning while improving our capacities and generating new resources." Includes the Wisconsin logo.
  - Section: **Range of Teaching through Faculty Learning Communities**. Text: "Education Matters: Purdue Academic Course Transformation (IMPACT) is an institution-wide effort that aims to provide faculty development and support to redesign courses to be more..." Includes a "Check out the effort" button.
- University of Missouri:**
  - Section: **Introductory Biology Course Redesign**. Text: "The University of Missouri implemented opportunities for faculty to redesign courses to be more effective and engaging for student learning. Uninspiring courses have been cited..." Includes a "Check out the effort" button.
  - Section: **University of Missouri**. Text: "The goal of the institutional STEM reform at the University of Missouri is to improve the quality of undergraduate teaching and learning in science, technology, engineering, and mathematics. As we more effectively fulfill our mission to produce and disseminate knowledge, we will improve the quality of life in Missouri, the nation, and the world. We focus on interdisciplinary collaboration, evidence-based teaching practices, and experiential learning to achieve lasting reform. Our programs facilitate early exposure to STEM disciplines, provide students with unique undergraduate research opportunities, and use active learning strategies in and outside the classroom. Faculty are redesigning..." Includes the Mizzou logo.
- University of Pittsburgh:**
  - Section: **Science Education Alliance-Phage Hunters Advancing Genomics and Evolutionary Science**. Text: "The SEA-PHAGES program is a national, two-semester, discovery-based undergraduate research course that..." Includes a "Check out the effort" button.
  - Section: **EM Initiatives**. Text: "EM initiatives include the Engineering, Education, and Research Center (db-SERC), and the HHMI funded SEA-PHAGES program. The Learning Research and Development Center (LRDC) acts as a hub to support, coordinate, and develop research in learning and education. Join group discussions. Connect with other members." Includes the University of Pittsburgh logo.
- Purdue University:**
  - Section: **Purdue University**. Text: "Purdue challenges traditional teaching by changing the way classes are taught based on our research that identifies how today's students learn best. Purdue has already redesigned 62 courses, focusing on fewer lectures, more group projects, and incorporating online and in-class components to optimize faculty-student interaction. For instance, with access to personal electronics and shared information in the redesigned general chemistry course, students performed significantly better on the American Chemical Society national standardized exams. Other results indicate that students have higher perceived levels of engagement, confidence and competence in the redesigned courses that may correlate to higher grade-point averages. Purdue aims to double the rate of class transformation within the next three years, and lead the nation's universities in creating a new world of learning." Includes the Purdue University logo.
- Washington University in St. Louis:**
  - Section: **Washington University in St. Louis**. Text: "We foster broad-based incorporation of effective active-learning throughout the university. For students, our goals are to: 1) long-term retention of information and deeper conceptual satisfaction and persistence in STEM career paths. For faculty, we promote cultural change toward these evidenced-based..." Includes the Washington University in St. Louis logo.

# Thank you

Ilya Shunko- Hubzero Designer

Emily Miller – AAU STEM Initiative Project Director

Matt Stephen – AAU STEM Initiative Project Assistant

