EER&I Networking Session
Connecting and Expanding the Engineering Education Research & Innovation (EER&I) Communities

ASEE Annual Conference – June 27, 2018 – W396 – 11:30 pm – 1:00 pm

Facilitated By

Karl A. Smith
Purdue University and
University of Minnesota

Ruth A. Streveler
Purdue University

Rocio Chavela Guerra
American Society for
Engineering Education

Agenda

Introduction of session and facilitators	**~10 min**
Updates on status of EER&I	**~35 min**

- EER initiatives – Ruth Streveler
- EEI initiatives – Rocio Chavela Guerra & Karl Smith
- Brief Reports
    - EER Impact Study - Audeen Fentiman
    - EER Departments and Resources – Ken Yasuhara & Adam Carberry
    - NAE Updates – Beth Cady
    - Utah State – Online Certificate Program – Ning Fang
    - Kern Entrepreneurial Engineering Education Network (KEEN) – Doug Melton

Participant Networking	**~35 min**

- Rapid introductions around guided questions – Brief conversations in groups of 3 – as a way to meet many people
- Identification of "intellectual neighborhoods" around research and innovation questions and opportunities – individual reflection and writing

Reflection on strategies to connect, expand, and sustain the emerging EER and EEI communities	**~10 min**

"*Research Briefs*"

- ## MONTHLY PODCAST ABOUT EER

- ## Subscribe on iTunes
- Questions? Contact Streveler@purdue.edu

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ASEE AMERICAN SOCIETY FOR ENGINEERING EDUCATION

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Grantees Meetings

NSF Engineering Education and Centers
Grantees Conference

eecconference.asee.org

ERC ENGINEERING RESEARCH CENTERS

ercbiennial.asee.org

RED REVOLUTIONIZING ENGINEERING AND COMPUTER SCIENCE DEPARTMENTS PRINCIPAL INVESTIGATORS MEETING

redmeeting.asee.org

NSF Emerging Frontiers and Multidisciplinary Activities
Germination Workshop

germination.asee.org

SMART START
DESIGNING IMPACT-DRIVEN PROJECTS

2 weeks
Online Hybrid
Opportunity to develop 'proof-of-concept' evidence towards sustaining and scaling an educational innovation
Focus on Value Proposition + Customer Segment 'fit'
***2019 ASEE Annual Conference** June 15, Tampa, Florida ***Online** Spring 2019

engineering education community resource

152 centers & groups

68 graduate programs

82 conferences & workshops

66 journals

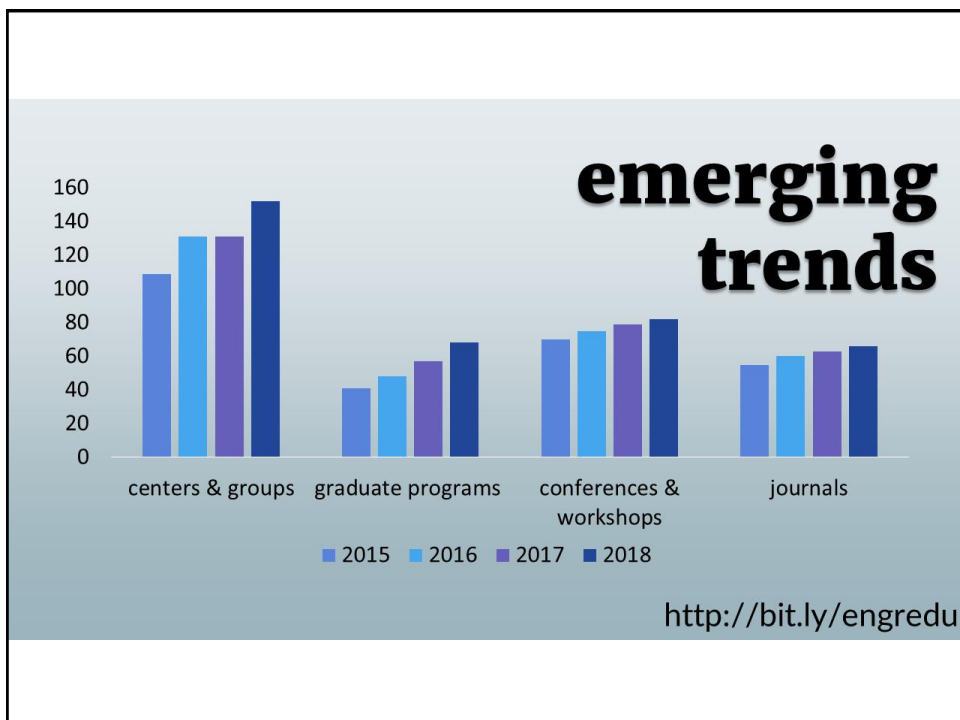*...and more*

Adam Carberry
Ken Yasuhara

http://bit.ly/engredu

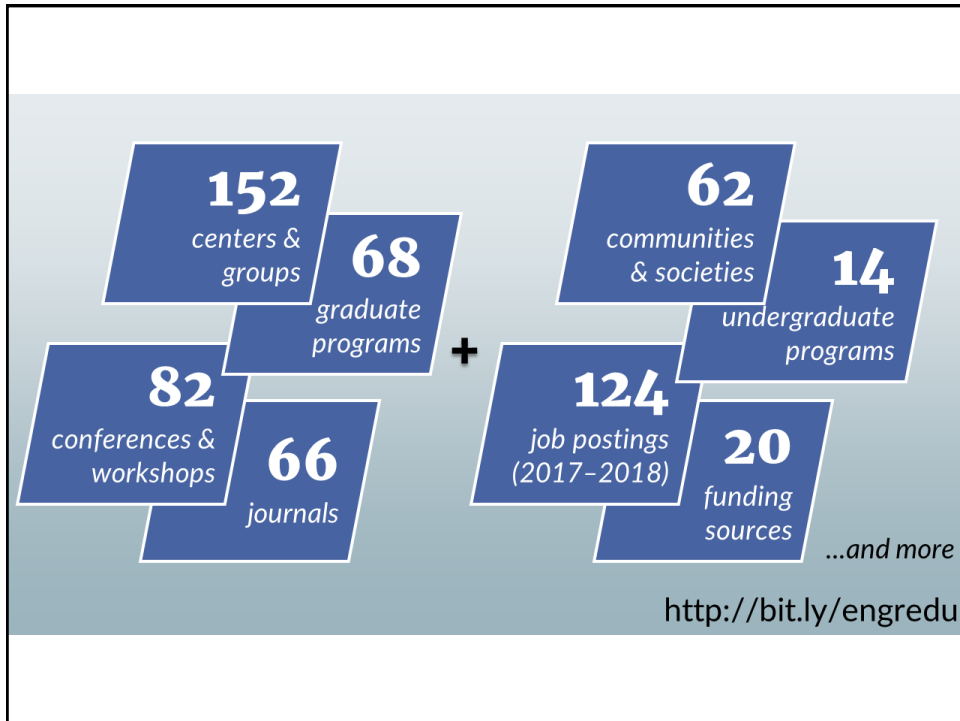# history

- wiki created in 2011
- collaboration between ASEE Student Division and UW CELT and Engineering Teaching & Learning office

http://bit.ly/engredu

152 centers & groups

68 graduate programs

82 conferences & workshops

66 journals

+

62 communities & societies

14 undergraduate programs

124 job postings (2017–2018)

20 funding sources

...and more

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emerging trends

160
140
120
100
80
60
40
20
0

centers & groups   graduate programs   conferences & workshops   journals

■ 2015 ■ 2016 ■ 2017 ■ 2018

http://bit.ly/engredu

things to watch for

- country column
- event listings (e.g., Ph.D. program open houses)
- links to other sites
- guest editorial

http://bit.ly/engredu

what our "fans" say

- found a job
- learned about the field
- supported the creation of new program or center
- identified an appropriate journal to submit to or conference to attend

http://bit.ly/engredu

final note

The Engineering Education Community Resource requires a community!

WE NEED YOU

http://bit.ly/engredu

NAE Program Activities www.nae.edu

Ensuring Engineering Talent

❖ *Post-Secondary Engineering Education*
❖ *K-12 Engineering Education*
❖ *Diversity of the Engineering Workforce*
❖ *Frontiers of Engineering*
❖ *Engineering Ethics and Society*

Public Understanding of Engineering

❖ *Awards Program*
❖ *Communications with the public, media, and the profession*
❖ *The Bridge*
❖ *Grand Challenges for Engineering*

Engineering and Society

❖ *Manufacturing, Design, and Innovation*

NATIONAL ACADEMY OF ENGINEERING

NAE Reports related to engineering education and workforce development
www.nap.edu

LinkEngineering

EngineerGirl

17

https://www.engineergirl.org/61291/Ambassadors
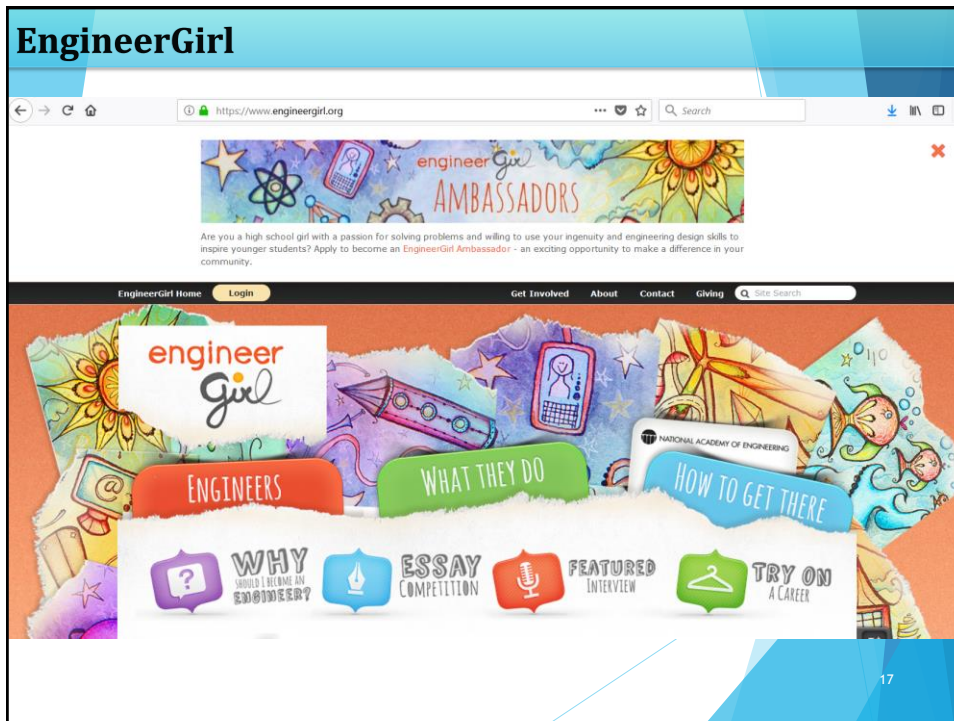
- Targets high performing High School Girls
- Students apply with a proposal to reach younger girls in their communities.
- Application is submitted jointly with a local sponsor.
- Sponsors and students meet together for training and networking at the SWE Annual Conference.
- Additional training and community building occur via online meetings throughout the year.
- Students receive $250 mini grant, travel, training, recognition, and support.

Online Ethics Center

Engagement of Engineering Societies in Undergraduate Engineering Education

Workshop Proceedings December 2017

5 follow on meetings on collaboration topics
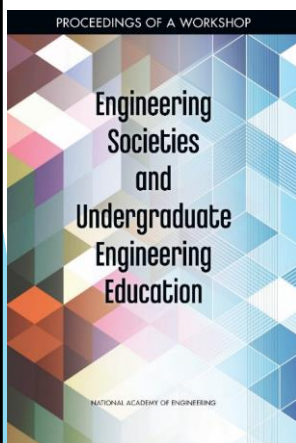
- Joint student competitions based on Grand Challenges – Sept 18 at USC
  - Proceedings in Brief published February 2018
- Identifying faculty "impact" in engineering – Feb 12 at Georgia Tech
  - Proceedings in review process
- Engineering societies' activities in promoting diversity and inclusion – June 4 at U Cincinnati
- Cross-society marketing message for engineers
- Aligning education and training with pace of engineering change

Grand Challenges Scholars Program

The program inculcates design thinking and enables students to cultivate higher order skills, including synthesis, connectivity, and contextualizing. GCSPs help create confident engineering leaders ready to address the most pressing issues of the 21st century. Graduates achieve five competencies through a combination of curricular, co-curricular and extracurricular experiences:

1. Talent
2. Multidisciplinary
3. Business/entrepreneurship
4. Global/Multicultural
5. Social consciousness

NAE GRAND CHALLENGES SCHOLARS PROGRAM®

http://www.grandchallengescholars.org

Frontiers of Engineering
Mission Statement

▶ To bring together outstanding early-career engineers from companies, universities, and government labs to discuss leading-edge research and technology, bridging traditional disciplines, and to transfer techniques and approaches across fields in order to sustain and build innovative capacity.

▶ To promote career development and create a network of future engineering leaders to ensure the continuing vitality of the engineering profession.

More information at: https://www.naefrontiers.org/

Certificate of Engineering Education (CEED) Program

Ning Fang
Professor, Interim Head
Department of Engineering Education
Utah State University

UtahStateUniversity
ENGINEERING EDUCATION

125th ASEE Conference
Salt Lake City, UT
June 27th, 2018

Department of Engineering Education

PhD in Engineering Education program: started in 2008

PhD students: 30

> ➤ 16 currently
> ➤ 14 graduated - 100% job placement

Engineering education faculty: 8

Courses taught:

> ➤ The first two years' undergraduate engineering courses
> ➤ Engineering education graduate courses

UtahStateUniversity
ENGINEERING EDUCATION

CEED: Audience

Anyone who has a bachelor's degree or higher in an engineering discipline and is interested in learning how to teach. Examples:

➢ Junior faculty members

➢ Graduate students

➢ Trainers in industrial companies

The CEED program is highly practice-oriented, rather they theory-oriented.

UtahStateUniversity
ENGINEERING EDUCATION

CEED: What to Learn?

Spring (Two 7-week courses)			Fall (Two 7-week courses)		
EEDC 6450	Principles of Engineering Teaching and Learning	3 cr	EEDC 6090	Engineering Course Design	3 cr
EEDC 6150	Assessing Learning and Teaching in Engineering	3 cr	EEDC 7310	E-Learing Course and Training Development in Engineering	3 cr
EEDC 7900*	Teaching Internship in Engineering Education				1 cr

UtahStateUniversity
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CEED: How to Learn?

Fully (100%) online

Synchronous and asynchronous sessions on Canvas

  ➢ Students learn at their own pace, anytime, anywhere

Team teaching: two instructors for each course

  ➢ Students learn from instructors with complementary expertise

Flipped class: accessible videos and PowerPoint slides

  ➢ Maximize student learning outcomes

UtahStateUniversity
ENGINEERING EDUCATION

CEED: Cost

The average tuition cost for this two-semester program is $7,600 (varies based on residency status).

http://www.eed.usu.edu/

ning.fang@usu.edu

UtahStateUniversity
ENGINEERING EDUCATION

KEEN
ENGINEERING UNLEASHED

**Intercollegiate
Educational
Research Laboratory**

- **34 Partner Institutions**

- **4,000 engineering faculty**

- **60,000 engineering undergraduates**

- **Assessment Working Group**

KEEN
ENGINEERING UNLEASHED

Sampling of activity

- **Study of situational and dispositional curiosity**

- **Relationships between motivation, identity, and mindset**

- **Multi-year reflection-based portfolios and narrative**

- **Impact of multi-modal faculty development**

Participant Networking Activity (~35 min)

- **Introductions with Guided Format**
- **Ad Hoc Conversations in Groups of 2-3**
  – Your Name & Organization
  – Status of EER&I Center or PhD Program/Interest in EER & EEI
  – Suggestions for Starting/Questions About Starting
  – Exchange Business Cards/Contact Information
  – Identify "intellectual neighborhoods" around common research, organization or other questions and interests
  – Talk about ways to follow up
- **Move to a new group when you're ready**

Connecting, Expanding & Sustaining the Emerging EER Community (~10 min)

- **Reflect on your interests and plans for engineering education research & innovation**
- **Jot down**
  - What do you plan to do next?
  - What are your longer range plans?
- **Continue the conversation during the ASEE conference and beyond**
  - EER&I Networks –REEN, SEFI, National Innovation Network (NIN), NSEC, etc.
  - ASEE Engineering Education Research and Innovation website -

Thank you!

An e-copy of this presentation will be posted to:
http://personal.cege.umn.edu/~smith/links.html

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