

Engineering Education Research Networking Session

# Connecting and Expanding the Engineering Education Research Community

*Special Session in partnership with the*  
Rigorous Research in Engineering Education Initiative  
(DUE 0817461)  
CLEERhub.org

ASEE/IEEE Frontiers in Education Conference – October 29, 2010 – F3B – 4:30 pm – 6:00 pm

## Facilitated By

**Karl A. Smith**  
Purdue University and  
University of Minnesota

**Ruth A. Streveler**  
Purdue University

**Qaiser Malik**  
Purdue University

# Agenda

## What are we going to do?

- Welcome and Overview (~5 min)
- Update on EER (~10 min)
  - ASEE 2010 EER Networking Session
    - EER Centers, PhD Programs
  - National Research Council – Discipline Based Education Research
- Participant Networking Activity (~30 min)
- Brief Report on Status of RREE Project (~15 min)
  - EER workshops and EER – JEE Collaboration
  - Collaboratory for Engineering Education Research (CLEERhub.org)
- Strategies to Connect, Expand, and Sustain the Emerging EER Community (~10 min)
- Wrap Up and Next Steps (~5 min)

Engineering Education Research Networking Session  
**Connecting Engineering Education  
Research Programs from Around the World**

*sponsored by the*  
ASEE International Division

*in partnership with*  
Rigorous Research in  
Engineering Education Initiative  
CLEERhub.org  
*And the Journal of Engineering Education*

ASEE Annual Conference – June 22, 2010 – Session 2123

**Facilitated By**

**Karl A. Smith**  
Purdue University and  
University of Minnesota

**Jack Lohmann**  
Georgia Tech

**Hans Hoyer**  
ASEE

**Ruth A. Streveler**  
Purdue University

**Satish Udpa**  
Michigan State University

**Stephanie Eng**  
ASEE

# ASEE 2010 – EER PhD Program Briefings

- **Utah State University – Kurt Becker**
- **Purdue University – David Radcliffe & Robin Adams**
- **Universidad de las Americas, Puebla, Mexico – Enrique Palou**
- **Virginia Tech – Maura Borrego**
- **Universiti Teknologi Malaysia – Zaini Ujang**
- **Clemson University – Lisa Benson**
- **NITTTRs – India – R. Natarajan**
- **Arizona State University – Tirupalavanam Ganesh & Chell Roberts**
- **University of Washington – Cindy Atman**
- **Ohio State University – Lisa Abrams**
- **Carnegie Mellon University – Paul Steif**
- **University of Michigan – Cindy Finelli**
- **Washington State University – Denny Davis**
- **University of Georgia – Nadia Kellam & Joachim Walther**
- **Michigan State University – Jon Sticklen**
- **University of Colorado – Boulder – Daria Kotys-Schwartz**

Session slides and links to programs posted to [CLEERhub.org](http://CLEERhub.org)

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Board on Science Education  
 The National Academies  
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## Status, Contributions, and Future Direction of Discipline-Based Education Research (DBER)

The National Science Foundation has funded a synthesis study on the status, contributions, and future direction of discipline-based education research (DBER) in physics, biological sciences, geosciences, and chemistry. DBER combines knowledge of teaching and learning with deep knowledge of discipline-specific science content. It describes the discipline-specific difficulties learners face and the specialized intellectual and instructional resources that can facilitate student understanding.

This 30-month study will build on two workshops held in 2008 to explore Evidence on [Promising Practices in Undergraduate Science, Technology, Engineering, and Mathematics \(STEM\) Education](#). It will answer questions that are essential to advancing DBER and broadening its impact on undergraduate science teaching and learning. An interdisciplinary panel of experts will synthesize empirical research on undergraduate teaching and learning in the sciences; explore the extent to which this research currently influences undergraduate instruction; and identify the intellectual and material resources required to further develop DBER.

The final product will be a consensus report that will provide guidance for future DBER research. In addition, the findings and recommendations of this study may invite, if not assist, postsecondary institutions to:

- increase interest and research activity in DBER, and improve its quality and usefulness, across all natural science disciplines
- guide instruction and assessment across natural science courses to improve student learning
- bring greater focus to issues of student attrition in the natural sciences that are related to quality of instruction

MEETINGS	LOCATION	RESOURCES
Committee Meeting 1 June 28-29, 2010	Keck Center, Room 101 500 5 <sup>th</sup> Street, NW Washington, DC	<a href="#">Agenda</a>
Committee Meeting 2 October 18-19, 2010	Keck Center, Room 201 500 5 <sup>th</sup> Street, NW Washington, DC (limited space)	<a href="#">Agenda</a>
Committee Meeting 3 December 3-4, 2010	Beckman Center Irvine, CA	

### COMMITTEE

[Committee Membership](#)

### STAFF

Natalie Nielsen Study Director  
 Heidi Schweingruber, Deputy Director, BOSE  
 Margaret Hilton, Senior Program Officer, BOSE  
[Rebecca Krone](#), Program Associate

[http://www7.nationalacademies.org/bose/DBER\\_Homepage.html](http://www7.nationalacademies.org/bose/DBER_Homepage.html)

# Participant Networking Activity (~30 min)

- **Introductions with Guided Format**
- **Four (~7 min) Conversations in Groups of 2-3**
  - Your Name & Organization
  - Status of EER Center or PhD Program/Interest in EER
  - 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
- **Bell will ring once after 6 min and twice after 7 min**
- **Move to a New Group**

# Status of RREE Project

- **EER workshops and EER – JEE Collaboration**
  - **Fundamentals of Educational Research**
    - ASEE 2010
    - FIE 2010
  - **Selecting Conceptual Frameworks for Engineering Education Research**
    - RCEE/UTM Malaysia 2010
    - ASEE 2010
  - **Understanding Qualitative Research**
    - FIE 2010
- **Collaboratory for Engineering Education Research (CLEERhub.org)**

## Getting Started in Educational Research

Wednesday, October 27, 2010 11am-2pm  
 Pre-conference workshop held at the FIE (Frontiers in Education) Conference, Arlington, VA

Register >

## Welcome to CLEERhub.org!

CLEERhub.org is a digital habitat with the mission to address the continued need for developing engineering education researchers by leveraging the success of past NSF-funded programs such as RREE, ISEE and CAEE and the expertise gained by various project team members.

CLEERhub.org is part of a NSF-funded project called Expanding and sustaining research capacity in engineering and technology education. Building on successful programs for faculty and graduate students (DUE-0817461).

### Guide Books

- Building a Network of Mentors
- Quantitative Research in Education
- Conceptual Frameworks For Research
- Qualitative Research Basics

### Upcoming Events

- OCT 27** Understanding Qualitative Research Workshop- Understanding Qualitative Research FIE (Frontiers in Education) Conference ...
- OCT 27** Getting Started in Educational Research Workshop - Fundamentals of Educational Research FIE (Frontiers in Education) Conference ...

More events >

### Rigorous Research in Engineering Education

Creating a Community of Practice (PPT)

#### Workshops

- Exploring How People Learn Engineering August 2010
- Malaysia 2010: Qualitative Research
- ASEE 2010: Connecting EER Programs from Around the World
- Merida, Mexico 2009
- Taiwan 2009
- more...

### Collaborate

- Upload Content  
Share your materials on this site
- Form a user group  
Share things in private with your colleagues
- Take a Poll  
Do you like this site?
- Give us Feedback  
Success story? Suggestions?
- Contact Us  
How to reach us





- **Ordinary Users can:**
  - » browse the site and look at all open resources
  - » submit tickets anonymously
- **Ordinary Users cannot:**
  - » run simulation tools
  - » interact with other users
  - » rate content, post questions etc.

- Browse the site

**Resources: All**

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**Workspace**

15 Sep 2010   Tools   Contributor(s): [Nicholas J. Kisseberth](#)  
Workspace

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**Building a Network of Mentors: A Guide for Engineering Educators**

26 Feb 2010   Publications   Contributor(s): [Mary Deane Sorcinelli](#)

Mentoring has long been viewed as a powerful means of enhancing the professional success and personal well-being of career faculty. In response, a number of institutions have developed mentoring programs, often shaped by the tra

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**Planning, Implementing, and Reporting Quantitative Research in Education: A User's Guide**

26 Feb 2010   Publications   Contributor(s): [R. Brent Stansfield](#)

This document is designed to help education researchers plan similar research programs. Sections are organized as follows: First, we will discuss how exploratory research can suggest theories and causal models, but cannot test them. §

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**A Guidebook On Conceptual Frameworks For Research In Engineering Education**

26 Feb 2010   Publications   Contributor(s): [Marilla D. Svinicki](#)

Why should you care about the conceptual frameworks that underlie research on teaching and learning? I propose that you should care without understanding the underlying principles that support and affect it in the first place. Wouldn't you look to c

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**Qualitative Research Basics: A Guide for Engineering Educators**

- Download open resources

### A Guidebook On Conceptual Frameworks For Research In Engineering Education

Posted 26 Feb 2010 in [Publications](#)

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[Reviews](#)

Contributor(s) [Marilla D. Svinicki](#)  
 University of Texas at Austin

**Abstract** Why should you care about the conceptual frameworks that underlie research on teaching and learning? I propose that you wouldn't consider redesigning a bridge without understanding the underlying principles that support and affect it in the first place. Wouldn't you look to current models of mechanics, materials science, civil engineering, geology, maybe even climatology to inform your questions about its form and function? Those specialties would help you understand the kinds of data to gather, the questions to ask, the variables to consider. They would save you time and effort by focusing your attention on key components that your new design should investigate. They would help you interpret the data you collect and make decisions about what to do at each stage of the process.

The same is true for redesigning educational systems. The underlying models for education come from psychology, sociology, communications, and other behavioral sciences. Just as models from the disciplines listed in the previous paragraph would in engineering, the models in the fields in this paragraph will help researchers in engineering education to save time and effort and to ask reasonable questions informed by what is known about the influences on human learning.

What follows in the sections of this guidebook is a series of question clusters about education that a group of engineering educators generated at a retreat in August of 2007 organized around the HPL metaframework. Each set of questions used to represent the kinds of theoretical frameworks that might be appropriate to consider in searching for an answer. The framework descriptions are not exhaustive, but they are well-grounded in educational theory as it stands today.

0.0 RANKING  
 “ 0 citations  
 ★ 0 review(s) ([Review this](#))  
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**Supporting Documents**

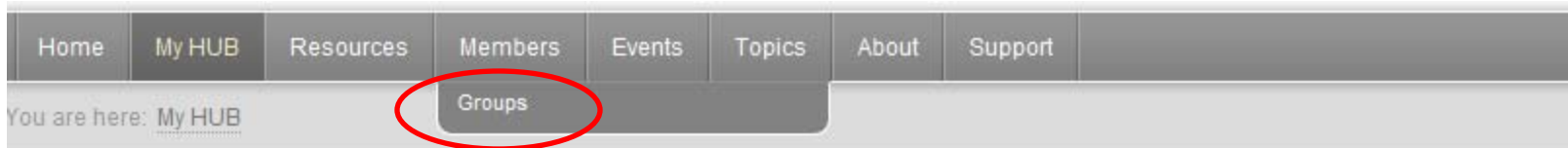
[Conceptual Frameworks Guidebook Revised 2010](#)  
 (PDF, 1.07 Mb)

[RREE\\_Conceptual\\_Framework](#)  
 (PDF, 652.9 Kb)

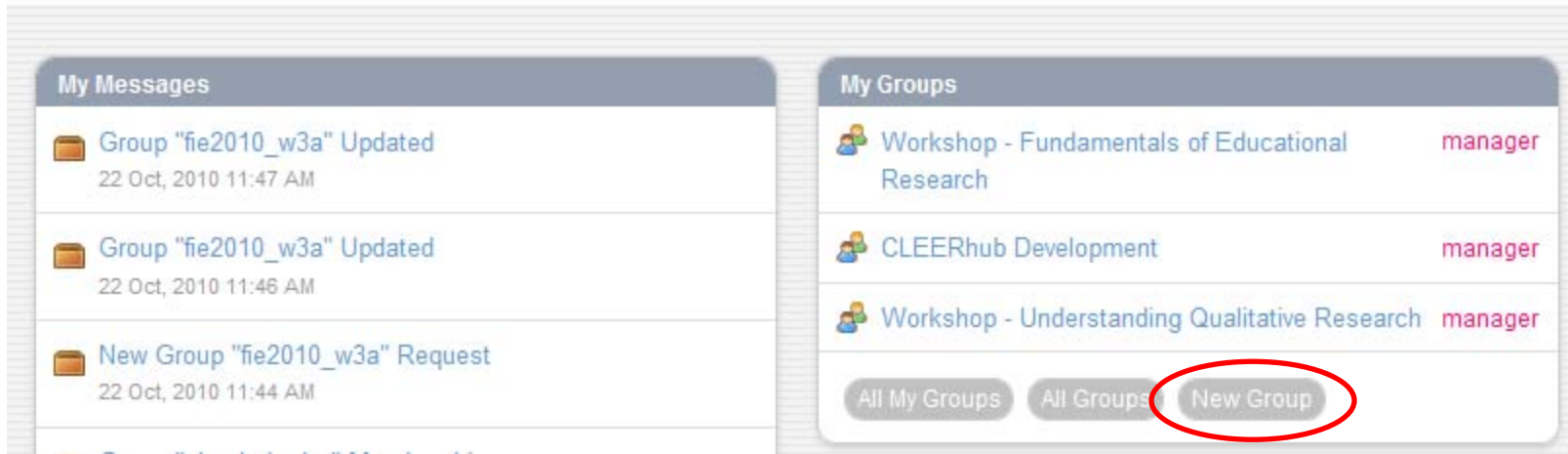
- **Registered Users Can...**
  - » Create and edit their profile page
  - » Post events
  - » Run simulation Tools
  - » Participate in the Questions & Answers forum
  - » Submit, comment on, and monitor support tickets
  - » Submit a new resource/content
  - » Interact with other users using groups

## User Types: Registered Users - Groups

- Creating a new Group



### My cleerhub



# User Types: Registered Users - Groups

- **Groups – Overview**

## Workshop - Fundamentals of Educational Research

Overview Members Wiki Resources Discussion

### About (private)

This group is created to provide a space for the workshop participants and facilitate quality technical and educational research in engineering. Aim is to facilitate the research. Group activity may help in developing long term association among the

This workshop is sponsored by the National Science foundation through Expand Building on successful programs for faculty and graduate students (DUE – 08174

[Workshop\\_Information.pdf](#)

This group is managed by:

Ruth A. Streveler: [streveler@purdue.edu](mailto:streveler@purdue.edu)

**manager**

**Managers:** Qaiser Hameed  
Malk

**Members:** 23

**Access:** Public

**Join Policy:** Invite Only

**Created:** 21 Oct. 2010

**Tags:** engineering  
education  
research

research methods

RREE2

 Edit this group

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 Invite users

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### Visits

Jan 1, 2010 - Oct 23, 2010

Comparing to: Site



### 1,777 visits from 2 visitor types

#### Site Usage

<b>Visits</b> <b>1,777</b> % of Site Total: 100.00%	<b>Pages/Visit</b> <b>6.60</b> Site Avg: 6.60 (0.00%)	<b>Avg. Time on Site</b> <b>00:05:00</b> Site Avg: 00:05:00 (0.00%)	<b>% New Visits</b> <b>57.34%</b> Site Avg: 57.23% (0.20%)	<b>Bounce Rate</b> <b>43.84%</b> Site Avg: 43.84% (0.00%)
<b>Visitor Type</b>	<b>Visits</b>	<b>Visits</b>	<b>Visits</b>	
■ New Visitor	1,019	57.34%		
■ Returning Visitor	758	42.66%		



1,777 visits came from 5 continents

### Site Usage

<b>Visits</b> <b>1,777</b> % of Site Total: 100.00%	<b>Pages/Visit</b> <b>6.60</b> Site Avg: 6.60 (0.00%)	<b>Avg. Time on Site</b> <b>00:05:00</b> Site Avg: 00:05:00 (0.00%)	<b>% New Visits</b> <b>57.34%</b> Site Avg: 57.23% (0.20%)	<b>Bounce Rate</b> <b>43.84%</b> Site Avg: 43.84% (0.00%)
Continent	Visits	Visits	Visits	
Americas	1,496	84.19%		
Europe	118	6.64%		
Asia	118	6.64%		
Oceania	34	1.91%		
Africa	11	0.62%		



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### Pageviews for all visitors

Jan 1, 2010 - Oct 23, 2010

Comparing to: Site



**11,722** Pageviews

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Mar 1, 2010 - Mar 31, 2010	9.83% (1,152)
Apr 1, 2010 - Apr 30, 2010	5.02% (589)
May 1, 2010 - May 31, 2010	13.27% (1,556)
Jun 1, 2010 - Jun 30, 2010	10.96% (1,285)
Jul 1, 2010 - Jul 31, 2010	8.88% (1,041)
Aug 1, 2010 - Aug 31, 2010	15.95% (1,870)
Sep 1, 2010 - Sep 30, 2010	12.57% (1,474)
Oct 1, 2010 - Oct 23, 2010	23.50% (2,755)

**Join CLEERhub...**

**Strengthen your community**

**Make a difference**

Thank you!

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

- **Small Group (2-3) Brainstorming**
  - Ideas for (1) local, (2) national, (3) international Community
  - Ideas for Virtual Community
  - Further Ideas
- **Summarize Ideas and Write on 3x5 card**

# Next Steps (~ 5 min)

- **Silently reflect on your interests and plans for engineering education research**
- **Jot down**
  - What do you plan to do next?
  - What are your longer range plans?
- **Continue the conversation during the FIE conference and beyond**
  - EER Networks – CLEERhub, REEN, SEFI
  - Meet again at ASEE Conference, June, 2011

# Acknowledgement

- We acknowledge the National Science Foundation for funding Karl Smith, Ruth Streveler, and Qaiser Malik's participation (DUE 0817461)
  - COLLABORATIVE RESEARCH: Expanding and sustaining research capacity in engineering and technology education: Building on successful programs for faculty and graduate students
- And the ASEE/IEEE Frontiers in Education Conference for Sponsoring

# Thank you!

An e-copy of this presentation will be posted to:

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