

# MRSEC Education Directors Network

## Fall 2011 Update

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DMR Directors Meeting; Oct 26, 2011



# Presentation outline

- Update on Education Directors Meeting
  - Invited talks, breakout groups and action items
  - Cross site evaluation initiatives
    - Logic Models
    - K-12 and Public Outreach
    - Netway update
    - REU
- Collaboration with other Professional Organizations
  - JAM & MRS
- Action items and next steps

# Fall 2011 Education Directors Meeting

## Overview:

- September 29-30, 2011 in downtown Chicago
- Organization and infrastructure provided by University of Colorado MRSEC
- Dinner funded by University of Chicago MRSEC
- Participation by 19 MRSECs including all of the newly funded CEMRIs.
- Presentations by 6 invited speakers
- Breakout sessions and working groups



# Fall 2011 Education Directors Meeting

## Meeting Goals:

- Increase the community's knowledge of STEM education research and diversity issues.
- Review MRSEC logic models
  - K-12 Students
  - Public Interactions
  - Professional Development
  - Undergraduate Students
  - Graduate Students
- Determine evaluation efforts next steps
- Communicate MRSEC Education Network efforts with wider communities.



# Fall 2011 Education Directors Meeting

## Invited speaker: STEM Education Research

- Speaker: Prof. Mel Sabella; Chicago State University
- Topic: *“Using Physics Education Research [PER] to Build an Understanding of Student Thinking”*
- Summary and conclusions:
  - Identify, understand and evaluate a diverse set of goals for the community you are working with.
  - Think about EO from a scientific perspective.
  - Consider value added by PER or Discipline Based Education Research [DBER]
  - Collaborate with colleagues in other disciplines and in education research





# Fall 2011 Education Directors Meeting

Invited speaker: Research Experiences for Teachers

- Speaker: Jay Dubner, Columbia University
- Topic: *RET Programs = Increased Student Achievement*
- Summary and conclusions:
  - Evaluation of 1990 – 2011 Research Experiences for Teachers programs
  - 8 week program; 1 day per week for pedagogical meeting
  - Establishment of professional learning communities and peer coaching programs.
  - Development and use of multi-site survey instruments
  - Survey results indicating value added by RET participation
  - Oct 2009 publication journal *Science*



# Fall 2011 Education Directors Meeting

**Panel speakers:** Science education for elementary students and diversity issues in undergraduate education

- Speaker: Dr. Lauren Kost-Smith;  
University of Colorado at Boulder
- Topic: *Addressing Gender Differences in Introductory Physics with Values Affirmation*



- Summary and conclusions:
  - Identify and understand gender differences in performance
  - Often attributed to insufficient background, psychological factors, attitudes and beliefs
  - Affirmative conditioning helps reduce gender gap in performance due to psychological factors



# Fall 2011 Education Directors Meeting

**Panel speakers:** Science education for elementary students and diversity issues in undergraduate education

- Speaker: Dr. John Almadore; James Madison University
- Topic: *Can Science Wait? The association between time allotted for science in elementary school and science achievement*
- Summary and conclusions:
  - Early exposure to science influences a later positive interest and greater scientific achievement
  - Frequency of science engagement is more significant than *duration* of exposure.





# Fall 2011 Education Directors Meeting

## Panel speaker: Diversity Initiatives

- Speaker: Dr. Cary Supalo; Purdue University
- Topic: *Promoting Hands-on Science Learning Experiences for Students with Blindness or Low Vision in STEM Classes*
- **Goal of the Independent Laboratory Access of the Blind [ILAB]** project was to raise the educational expectations of students with BVI [blindness or visual impairment], as well as those of educators, to enhance STEM recruitment.
- Opportunity for MRSECs to participate in diversity initiatives that make STEM more accessible to the BVI community



# Fall 2011 Education Directors Meeting

## Invited speaker: K-12 evaluation

- Speaker: Robert Tai, Professor  
University of Virginia
- Topic: *An Examination and Formulation of  
a New Conceptual Framework for  
Measuring Students' Interest and  
Engagement in Science*



### Summary and conclusions:

- There is a need for a “common”  
instrument to offer comparable data  
when:
  - Used across many different types of  
science education programs
  - Used by many different children with  
different backgrounds and ages



# Cross site evaluation:

## Orientation and review of Logic Models

- Session led by Dan Steinberg, Princeton University MRSEC
- History of Education Directors Network
- Development of Cross site Logic Models
- Overview of models
- Logic model breakout groups:
  - K-12 students
  - Public interactions
  - Undergraduate students
  - Professional Development
  - Graduate student training





## Cross site evaluation: Netway update

- The Netway Project is currently recruiting the final group.
- New Twist: This cohort will participate in “a new self guided, on-line version of the evaluation protocol”
- The primary benefit of MRSEC involvement in the Netway project is enhanced collaboration among MRSEC EO programs
- Cornell, U of Chicago and Yale will continue its collaboration with the goal of developing tools for analysis of evaluation data
- MRSEC Participant summary
  - Cohort 1: Cornell
  - Cohort 2: Chicago, Maryland, Yale
  - Cohort 3: Penn State, Minnesota, Nebraska, UCSB, and U. Washington
  - Cohort 4: Colorado School of the Mines, Northwestern, Ohio State, U. of Mass. Amherst, and U. of Pennsylvania
  - Cohort 5: TBD

# Cross site evaluation:

## URSSA [UG Research Student Self Assessment] Update

- URSSA: on-line survey instrument for use in evaluating student outcomes for undergraduate research experiences
- Pilot cross-site evaluation project: implement modified URSSA REU assessment instruments
- Project Status:
  - Implemented summer 2010 and 2011 [each year N=200; 20 MRSECs]
  - Need for a comparison group and analysis protocol
- Action item
  - Submission of white paper supporting establishment of comparison group and methods of analysis





# Collaboration with other Professional Organizations

- NSF Joint Annual Meeting (JAM II) – “Inclusive Excellence”
  - Goals:
    - support and encourage collaboration among researchers, educators, and administrators;
    - leverage resources across projects;
    - further advance the missions of NSF, EHR, and HRD; and for training.
  - June 6 - June 8, 2011 at Washington Hilton
- Materials Research Society (MRS)
  - Public Outreach Committee
  - Information and Tools for Education Task Force
  - Other collaborative projects





# Working Group Reporting & Action Items

## Cross site evaluation: K-12 & REU

- K-12 and public outreach
  - Need to learn from education research specialists;
  - Good fit between MRSEC K-12 logic model and research of Robert Tai
  - Variability across MRSEC K-12 program requires study
  - **Action item(s):** resubmit PRIME proposal with Tai & prepare pilot study proposal for submission to NSF
- REU Evaluation
  - Comparison of SRI and URSSA instruments
  - Clarify comparison groups & infrastructure for implementation
  - **Action item(s):** prepare proposals for both SRI and URSSA options

# Summary

- Fall 2011 Education Directors Network meeting was well attended and collaborative
- Outcomes include:
  - cross-site evaluation initiatives
  - plans to build on successful collaborations with other professional organizations

