Discipline-Based Education Research Group (DBER)

INTEGRATING STEM
Science, Technology, Engineering, and Math Education at Colorado

The Discipline-based Education Research (DBER) group began in 2004 as a forum through which faculty in science, technology, engineering and mathematics (STEM) departments could engage in conversations about effective education. It is based on the premise that the various STEM disciplines face both common and distinct pedagogical challenges. These issues are critical to effective university teaching, but no mechanism existed for sharing successes and challenges across departments.

Through a weekly seminar series, faculty and research students present their ideas, observations, and conclusions relating to particular problems and issues associated with promoting effective learning in STEM disciplines. Typically the group consists of faculty and students from a wide range of departments, including applied mathematics, astrophysics, chemistry & biochemistry, computer science, cognitive science, engineering, geology, mathematics, molecular, cellular & developmental biology, physics, and the school of education.

The DBER group meetings also serve as a forum within which iSTEM grant recipients describe the design of their projects, their observations and conclusions. DBER has also taken on broader challenges, such as: examining the proposed Colorado State Science Standards for coherence and "teachability"; working with CU Teach in the design of Functions and Modeling and Research Methods courses (part of the STEM teacher certification program), as well as considering the conceptual coherence of foundation courses in various disciplines.

For current topics and information visit:
www.colorado.edu/istem/DBER

Recent DBER seminar topics:

- Transforming upper division physics
- Learning through computer modeling
- Faculty attitudes to pedagogical techniques
- Learning through design in engineering
- Identification of conceptually difficult topics in specific STEM disciplines
- Approaches to integrating math and modeling into biology education
- An approach to improving the scientific thinking of students in an introductory class for non-science majors
- Course transformation through the use of learning assistants and pedagogically-based instruction

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References & Resources: Powell, K. 2003. Science Education: Spare me the lecture. Nature 425: 234-236
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