



Kate Spohr <kspohr@berkeley.edu>

CEO updates for the week of April 20

1 message

Kate Spohr <kspohr@berkeley.edu>

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To: CEO <education.outreach@lists.berkeley.edu>

Postdoc career event at UCSF

Define your path to success: How to navigate & network to the career you want—April 20th, 6:30pm, Genentech Hall Auditorium, UCSF Mission Bay. This event aims to help PhDs and postdocs in life science and health care kickstart their careers. Luke Kreinberg, Associate Director of the Career Development Program at Haas Business School, and business coach to Bain, McKinsey, Google, and Yahoo, will help you create your career strategy framework and tell your story to prospective employers. Sponsored by Curium and Biotech Connection Bay Area. RSVP here: <http://biotechconnection-bay.org/events/>.

NSF-funded workshop on outreach for undergraduate educators

Improving undergraduate education through science outreach (Oct 10-12). This NSF-funded professional development workshop aims to help faculty and college educators organize a course in how to do effective scientific outreach, develop an outreach program, provide guidance on how to host a large community science outreach event, and engage with K-12 teachers and museums. The workshop, 3-nights hotel, and meals are free to participants. The workshop will be delivered by science outreach experts from Cornell University's Naturalist Outreach Program, the Sciencenter, and Museum of the Earth at Cornell University in Ithaca, NY. For more information see 'Improving undergraduate education through science outreach' (<https://blogs.cornell.edu/outreachworkshop/>; <http://blogs.cornell.edu/naturalistoutreach>) or contact Dr. Linda S. Rayor (LSR1@cornell.edu).

New NSF directions in research related to broadening participation

Science of Broadening Participation — Building on previous investments, the NSF Directorate for Social, Behavioral & Economic Sciences (SBE) and the Directorate for Education & Human Resources (EHR) recently announced their interest in stimulating research related to the Science of Broadening Participation (SBP). The Science of Broadening Participation will employ the theories, methods, and analytic techniques of the social, behavioral, economic, and learning sciences to better understand the barriers that hinder and factors that enhance our ability to broaden participation in science, technology, engineering, and mathematics (STEM). [Follow this link](#) for information on NSF's SBP initiative and funding opportunities.

New research on STEM teaching, learning & broadening participation

The High School Environment and the Gender Gap in Science and Engineering *Despite the striking reversal of the gender gap in education, women pursue science, technology, engineering, and mathematics (STEM) degrees at much lower rates than those of their male peers. This study extends existing explanations for these gender differences and examines the role of the high school context for plans to major in STEM fields.*

Gender Differences in Science, Technology, Engineering, and Mathematics (STEM) Interest, Credits Earned, and NAEP Performance in the 12th Grade *This Statistics in Brief describes high school graduates' attitudes toward STEM courses (specifically, mathematics and science), credits earned in STEM fields, and performance on the National Assessment of Educational Progress (NAEP) mathematics and science assessments in 2009.*

Development of an Instrument to Assess Attitudes Toward Science, Technology, Engineering, and Mathematics (STEM) *In this study, a survey to measure student (grades 4-6) attitudes toward STEM and STEM careers was developed and administered to 662 students from two STEM-focused and three comprehensive (non-STEM-focused) schools. Cronbach's alphas for the whole survey and subscales indicated a high internal consistency. Statistically significant difference in means between students attending the STEM-focused and comprehensive schools on the two subscales of the survey and the overall survey were found. However, the explained variance for these results was approximately 1%. The survey is a useful tool to assess efficacy of*

STEM education programs on student attitudes toward STEM and STEM careers.

A Study of STEM Assessments in Engineering, Science, and Mathematics for Elementary and Middle School Students *The purpose of this study was to develop, scale, and validate assessments in engineering, science, and mathematics with grade appropriate items that were sensitive to the curriculum developed by teachers. The use of item response theory to assess item functioning was a focus of the study. The work is part of a larger project focused on increasing student learning in science, technology, engineering, and mathematics (STEM)-related areas in grades 4--8 through an engineering design-based, integrated approach to STEM instruction and assessment. The assessments are available to school districts at no cost and provide an important tool for gauging students' understanding of engineering, science, and mathematics concepts.*

A Framework for Quality K-12 Engineering Education: Research and Development *Recent U.S. national documents have laid the foundation for highlighting the connection between science, technology, engineering and mathematics at the K-12 level. However, there is not a clear definition or a well-established tradition of what constitutes a quality engineering education at the K-12 level. The purpose of the current work has been the development of a framework for describing what constitutes a quality K-12 engineering education. The framework presented in this paper is the result of a research project focused on understanding and identifying the ways in which teachers and schools implement engineering and engineering design in their classrooms. The framework is designed to be used as a tool for evaluating the degree to which academic standards, curricula, and teaching practices address the important components of a quality K-12 engineering education.*

STEM Integration: Evidence of Student Learning in Design-Based Curricula *This study focuses on student learning of engineering design practices and the development of engineering thinking skills during participation in design-based curricular activities and will seek to answer the question: "What evidence is present in students' engineering design project work of engineering learning?" Student teams working in a STEM integration curricular module implemented in a fifth grade science classroom were analyzed. This study employs case study methods as a means to deeply analyze each team's work through content analysis of student classroom artifacts and video analysis. We use the Framework for Quality K-12 Engineering Education, with a particular focus on process of design, STEM content, engineering thinking, and communication, as a lens for analyzing the engineering thinking involved in student learning. This research aims to develop an initial understanding of how to identify these engineering learning outcomes in classrooms, with the overall goal of developing engineering assessment tools for classroom teachers. Evidence of student learning outcomes for these key engineering components was found throughout student work and student interactions, though varying levels of learning were shown by each group. This study demonstrates that it is possible to identify student learning of engineering processes within a design-based curriculum.*

Please note: A reply to this email will be sent to the entire list.

About the Coalition for Education & Outreach (CEO) is an informal network of over 250 staff, faculty, and students who work in education and outreach projects related to science, technology, engineering and math (STEM) on the UCB campus and in the community. We host an elist and meet monthly during the academic year (October-May). Meetings are designed to encourage networking, information exchange, professional development, and mentoring among our members. [Click here](#) to subscribe or unsubscribe to the CEO elist.