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GENERAL ESSAYS AND ARTICLES

CURRENT INSIGHTS

Integrating Computation into Science Education

Julia Svoboda Gouvea

This installment of *Current Insights* examines calls to integrate computation into science education in order to support computational thinking, practices, and literacies.

ESSAY

Reading Primary Scientific Literature: Approaches for Teaching Students in the Undergraduate STEM Classroom

Lara K. Goudsouzian and Jeremy L. Hsu

Multiple approaches exist for teaching primary scientific literature (PSL) in undergraduate STEM courses. This article compiles and reviews such approaches by proposing an easily accessible framework for instructors. In addition, it highlights recommendations for both instructors and the STEM education research community based on the work presented.

ARTICLES

Biology Instructors See Value in Discussing Controversial Topics but Fear Personal and Professional Consequences

Abby E. Beatty, Emily P. Driessen, Amanda D. Clark, Robin A. Costello, Sharday Ewell, Sheritta Fagbodun, Randy L. Klabacka, Todd Lamb, Kimberly Mulligan, Jeremiah A. Henning, and Cissy J. Ballen

A national survey of biology instructors shows that instructors view the primary goal of science education as “understanding the world,” yet instructors hesitate to incorporate societally relevant content. This study addresses how an ideological awareness curriculum may bridge this gap and how instructor values and hesitations affect teaching practices.

“In the back of my mind”: A Longitudinal Multiple Case Study Analysis of Successful Black Women Biomedical Graduate Students Navigating Gendered Racism

Veronica Y. Womack, Letitia Onyango, Patricia B. Campbell, and Richard McGee

The coping strategies for dealing with negative racial stereotypes, among the Black women in this longitudinal case study analysis, shifted from opting to ‘prove others wrong’ or working harder to leaning on their social networks for camaraderie and advice.

The Benefits of Participating in a Learning Assistant Program on the Metacognitive Awareness and Motivation of Learning Assistants

Haley Breland, Courtney M. Clark, Shanna Shaked, and Melissa Paquette-Smith

This study uses a pretest–posttest design to measure changes in the metacognitive awareness and STEM motivation of students enrolled in an undergraduate learning assistant (LA) program. Results suggest that being an LA may foster positive growth in both of these domains.

The Disproportionate Impact of Fear of Negative Evaluation on First-Generation College Students, LGBTQ+ Students, and Students with Disabilities in College Science Courses

Carly A. Busch, Nicholas J. Wiesenthal, Tasneem F. Mohammed, Shauna Anderson, Margaret Barstow, Cydney Custalow, Jas Gajewski, Kristin Garcia, Cynthia K. Gilabert, Joseph Hughes, Aliyah Jenkins, Miajah Johnson, Cait Kasper, Israel Perez, Briana Robnett, Kaytlin Tillet, Lauren Tsefrekas, Emma C. Goodwin, and Katelyn M. Cooper

Fear of negative evaluation (FNE) is the primary factor causing student anxiety in active learning. This study of 566 undergraduates establishes that LGBTQ+, first-generation, and disabled students disproportionately experience FNE, which causes students to overthink their responses and reduces their participation in class.

Factors Influencing Instructors' Adoption and Continued Use of Computing Science Technologies: A Case Study in the Context of Cell Collective

Changsoo Song, Resa Helikar, Wendy M. Smith, and Tomáš Helikar

This study provides practical suggestions for the features to be prioritized in spending limited resources to create and improve educational technology like Cell Collective. The results suggest a need to prioritize features improving the learning rather than the teaching side to motivate instructors more effectively to adopt and use the technology.

Modifying Summer Undergraduate Research Programs during COVID-19 Increased Graduate School Intentions but Exacerbated Anxieties

Sara E. Grineski, Danielle X. Morales, and Timothy W. Collins

Data collected from U.S. undergraduate researchers in STEM during Summer 2020 is used to examine how summer undergraduate research experience (SURE) 2020 program cancellations affected student well-being in specific domains. Students whose SUREs were canceled had reduced anxiety but greater concerns about graduate school matriculation than those in modified SUREs.

On the Cover

Subcellular optogenetic control of the concentration of active G protein subunits leads to a polarized response in a RAW 264.7 macrophage cell. Optically recruiting mCherry CRY2-GRK2ct to one side of a cell (red) results in a directional response with an increase in a PIP3 sensor (green) and lamellipodia formation on the opposing side. by Patrick R. O'Neill and N. Gautam, Washington University School of Medicine