NATIONAL ACADEMIES Sciences Engineering Medicine

Imagining the Future of Undergraduate STEM Education
Wrap-Up Seminar: Envisioning Undergraduate STEM Education in 2040
Wednesday, May 4, 2022 · 1:00 PM–3:00 PM EDT

Moderator:

CATHY MANDUCA served as Director of the Science Education Resource Center (SERC) at Carleton College until 2020. Her work supported communities of educators in learning together and collaborating to create resources supporting widespread improvement in various aspects of education. Prior, Manduca was the Executive Director of the National Association of Geoscience Teachers from 2007 to 2019. Manduca has served on the elected leadership for the American Geophysical Union and AAAS Education Section in the past. Currently, she is a member of the Board on Science Education and the LabX Advisory Board for NASEM, as well as a fellow of the AAAS and the Geological Society of America. Manduca's research has focused on understanding faculty learning and the impact of professional networks on educational practice. She received her B.A. in Geology from Williams College and Ph.D. in Geology from the California Institute of Technology.

Undergraduate Student Perspectives

GEORGE FRANCIS is a graduate senior at the University of the Virgin Islands majoring in Communication.
DIVYA KIRANI is a current student at the University of California San Diego, majoring in Biology.
AMY PHUNG is a recent graduate of Olin College, earning a degree in Robotics Engineering.
GEORGE SEATON is a current student at the New York Institute of Technology majoring in Mechanical Engineering.

Presentation of Ideas from Past Seminars

LYNN ANDREA STEIN is a professor of Computer and Cognitive Science at the Olin College of Engineering. She is also the founding director of Olin's Initiative for Innovation in Engineering Education. Stein's research spans the fields of artificial intelligence, programming languages, and engineering and computer science education. From 1990 to 2000, Stein was an assistant and then associate professor in the EECS Department at MIT and at the AI Laboratory and Laboratory for Computer Science there. Stein has a bachelor's degree, cum laude, in computer science from Harvard and Radcliffe Colleges and master's and doctorate degrees in computer science from Brown University.

NICHOLAS HORTON is Beitzel Professor of Technology and Society (Statistics and Data Science) at Amherst College. He is also a fellow of the American Association for the Advancement of Science and will serve as the vice president of the American Statistical Association as of 2022. Horton has held numerous leadership positions including chair of the Committee of Presidents of Statistical Societies and chair of the ASA Curriculum Guidelines for

Undergraduate Programs in Statistical Science. His research involves the development and application of statistical methods with applications in psychiatric epidemiology and substance abuse research. Much of his work in recent years has focused on statistics and data science education. Horton completed his A.B. at Harvard College and his Sc.D. at the Harvard School of Public Health.

LEANNE CHUKOSKIE is an Associate Professor in the Department of Physical Therapy, Movement, and Rehabilitation Science in the Bouvé College of Health, and the Games Program in the College of Arts, Media, and Design at Northeastern University. Her lab develops sensor-enabled experiences for assessment, intervention, and education, especially for individuals with developmental differences. Chukoskie's research on gaze-driven video games for intervention and assessment has been funded by NIH for children on the autism spectrum and older adults experiencing cognitive decline. She has translated her training in the NSF-funded Science of Learning Centers into practice by applying active learning principles both in classes and in the internship program she leads for neurodiverse young adults. In 2017, Chukoskie co-founded BrainLeap Technologies which has won Phase I and II NSF SBIR awards and is seeking to change the way attention challenges are addressed by working through schools and directly with families. Chukoskie received her BA in Biological Basis of Behavior and Anthropology from the University of Pennsylvania and a Ph.D. in Neuroscience from New York University.

Perspective from the National Science Foundation (Sponsor)

Alexandra Medina-Borja is a Lead Program Officer in the Engineering Cluster of the Divison of Undergraduate Education at the National Science Foundation, where she was appointed Executive Secretary for the Sub-Committee of STEM Education of the Future of the EHR Advisory Board. She also manages the organization of the STEM Education 2026 and beyond initiative and is part of the inaugural group of program officers that spearheaded the Future of Work at the Human-Technology Frontier core research program in 2016. Medina-Borja has concentrated her work in areas related to the effective design and analysis of smart service delivery systems. She received her bachelor's degree in Engineering from Universidade Federal de São Carlos and her master's and doctoral degrees in Industrial and Systems Engineering from Virginia Tech.

Making Change Happen: Examples to Inspire

LESLIE GREGG-JOLLY is a Professor of Biology at Grinnell College. She is interested in DNA repair mechanisms and recombination. Gregg-Jolly was recognized for her excellence in mentoring female students, her contributions to institutional support for women and other minorities in science, and her role in co-founding the Scholarly Women's achievement Groups program at Grinnell. Gregg-Jolly received her bachelor's degree in Biochemistry from Vassar College and her master's and doctoral degrees in Biology from Yale University.

MICKI MEYER serves as the Lord Family Assistant Vice President for Student Affairs & Community at Rollins College. She oversees areas of campus that work directly with leadership

education, social innovation & entrepreneurship, civic engagement, service-learning, diversity and inclusion, student involvement, and college access. Prior, Meyer spent nine years as the director of community engagement, establishing a new standard for service-learning and community partnerships and fostering the earliest versions of Rollins' campus and community curriculum. Meyer also serves as a Certified Scholar for Florida Campus Compact and has been active with Ashoka U Changemaker Campus Network. She received her Bachelor of Science in Human Communications and Media Management from the State University of New York College at Fredonia and Master of Arts in College Student Personnel from Bowling Green State University (OH).

EMILY MILLER is the Deputy Vice President for Institutional Policy at the Association of American Universities. She directs the AAU Undergraduate STEM Education Initiative, the Ph.D. education initiative, and other grant-funded projects. She also staffs AAU's STEM Network and Association of Graduate Schools constituent groups and serves as liaison to the AAU Arts & Science Deans group. Previously, Emily was a research and curriculum specialist for the Association for Community College Trustees, an assistant director of career services at Tufts University, worked in alumni relations at Harvard Business School, and collaborated with the Association of Governing Boards. Emily earned her Ph.D. in Higher, Adult, and Lifelong Education from Michigan State University; MA in Education Policy and Management from Harvard Graduate School of Education; and BA in Political Science from Gettysburg College.

SEAN TVELIA is a Professor of Geology and Chair of the Department of Physical Sciences at Suffolk County Community College. In addition to his work in the classroom, Tvelia is the PI for the NSF-sponsored Geoscience Educational Opportunities and is a change agent on the NSF IUSE: Faculty as Change Agents Transforming Geoscience Education in Two-year Colleges. He also serves on the NAGT Professional Development Committee, and also a member of the Earth Educator Rendezvous planning committee. Tvelia's current research interest involves the relationship between glacial hydrology and glaciotectonic processes in the development of eastern Long Island landforms. He received a B.S. in chemistry from SUNY Oneonta and an M.S. in hydrogeology from Stony Brook University.

<u>Commentator:</u>

YVES SALOMON-FERNÁNDEZ is the Senior Vice President for Operations Planning at Southern New Hampshire University. Prior, she has served as President at Greenfield Community College from 2018 to 2021, President at Cumberland County College from 2016 and 2018, and Interim President at Massachusetts Bay Community College from 2015 to 2016. Salomon-Fernández has also worked as a consultant for the Bermuda Ministry of Education and the United Nations in Mexico. Salomon-Fernández knows first-hand how education can transform the lives of first-generation students and also the importance of maintaining higher education as a legacy for families. She earned her Bachelor's degree from the University of Massachusetts Boston, her Master's degree from the London School of Economics, and her Ph.D. from Boston College.