Undergraduate Educators Urge Broader Embrace of Innovation

Lagging science scores among incoming undergraduates have created new teaching challenges, experts gathered last month in Washington, D.C., said, sharpening the need to identify effective education strategies.

Innovative teaching is making headway on some campuses, but participants at the 2011 Transforming Undergraduate Education in Science, Technology, Engineering, and Mathematics (TUES) conference said these approaches must be more widely used.

Speakers at the meeting organized by the U.S. National Science Foundation and AAAS noted that promising projects in science, technology, engineering, and math (STEM) education are often isolated successes.

“If we want to inspire learning at all levels” of students, said Niccole Villa Cerveny, a geographer at Mesa Community College in Arizona, “we really need to come up with better ways to disseminate what’s created out of each one of these projects.”

Undergraduate educators are reshaping their lessons as some students arrive unprepared for college-level classes. In January, the National Assessment of Educational Progress released a report showing that only 21% of U.S. high school seniors were “proficient” in grade-level science knowledge. This month, a report in New York state showed that fewer than half of the state’s high school graduates are ready for college or skilled jobs in the workforce.

U.S. President Barack Obama’s FY 2012 budget, released 14 February, includes funding for 100,000 new STEM teachers. Some speakers at the TUES conference said these teachers will receive their first critical exposure to the sciences as undergraduates.

“The performance from K-12 students is connected to the capability of their teachers,” said Shirley Malcom, director of AAAS Education and Human Resources. “But the development of this capability is a responsibility that begins in our colleges and universities.”

The National Science Foundation’s TUES program (formerly the Course Curriculum and Laboratory Improvement program) has distributed grants to colleges and universities since 1999 to encourage education innovation. At the 26 to 28 January conference, more than 500 participants shared innovative projects such as home labs for astronomy and optics students, online calculus tutors, and classes in the virtual world Second Life to teach undergraduates about online security. Last year, AAAS published a report highlighting 17 innovative projects under way across the country (see www.aaas.org/go/ccli09).

This year’s meeting focused on the challenge of implementing these programs more broadly. “We want to seriously address what it will take to bring about a cultural shift to student-centered instruction,” said Linda L. Slakey, director of NSF’s Division of Undergraduate Education.

Phoebe Stubblefield, director of the Forensic Science Program at the University of North Dakota, said many faculty at her university are discouraged from using innovative methods because “the typical academic culture values research productivity over teaching and learning.”

Educators must move away from this notion of “I published, therefore I disseminated,” because publications reach a very small scientific community,” Cerveny said.

Teaching at the pre-college level suffers as a result, since “much of what we do is not available to K-12 teachers.”

Sparse support for science teaching could leave many ill prepared to join the 21st-century workforce, said Carl E. Wieman, a former U.S. professor of the year and now associate director for science at the White House Office of Science and Technology Policy. He urged educators to evaluate new programs with an eye toward discouraging rote memorization and encouraging students to think like scientists.

—Cheryl Toksoz and Becky Ham

India, AAAS Explore Science Diplomacy

India and the United States should explore a range of cooperative initiatives in science and technology, including joint projects in developing nations such as Afghanistan and large-scale research collaborations, delegates concluded at a workshop in Bangalore.

These recommendations and others emerged from a 3-day workshop on science diplomacy, organized by India’s National Institute of Advanced Studies (NIAS) and AAAS, that convened top-level scholars, diplomats, and science policy leaders. They explored an area that holds great promise and importance: How can the two science powers conduct science diplomacy and cooperate on critical science-related issues?

Participants from both nations urged follow-up efforts to build an enduring and productive relationship.

“We should be addressing as partners some of the pressing global problems like renewable energy, climate change, or drugs for infectious diseases,” said NIAS Director V. S. Ramamurthy, a nuclear physicist and former secretary to the Indian Department of Science and Technology.

“Such things will happen when diplomats and policy-makers learn to appreciate the scientific and technological strengths and needs of the [two] countries.”

“We are living at a time when science and technology are embedded in almost all of human activity,” said AAAS Chief Executive Officer Alan I. Leshner, the executive publisher of Science. “The global scientific community has to function in a more global way…. Bilateral scientist-to-scientist contact and collaboration are not enough to do this. There is a requirement to ‘harmonize’ global science—to make values, policies, and regulations compatible.”

The meeting was supported by the Indo-U.S. Science and Technology Forum.
Results of the 2010 Election of AAAS Officers

Following are the results of the 2010 election. Terms began on 22 February 2011.

General Election
President: William H. Press
Board of Directors: Raymond L. Orbach; Inder M. Verma
Committee on Nominations: Francisco J. Ayala; Sandra M. Faber; Jo Handelsman; Thomas D. Pollard

Section on Agriculture, Food, and Renewable Resources
Chair Elect: Donald R. Ort
Member-at-Large of the Section Committee: Cynthia Rosenzweig
Electorate Nominating Committee: Harry J. Klee; Richard T. Sayre

Section on Anthropology
Chair Elect: Leslie C. Aiello
Member-at-Large of the Section Committee: Susan Antón
Electorate Nominating Committee: Arlen F. Chase; Lynnette Leidy Sievert

Section on Astronomy
Chair Elect: Charles Alcock
Member-at-Large of the Section Committee: Amy J. Barger
Electorate Nominating Committee: Heidi B. Hammel; Scott J. Kenyon

Section on Atmospheric and Hydrospheric Sciences
Chair Elect: Susan K. Avery
Member-at-Large of the Section Committee: Michael E. Mann
Electorate Nominating Committee: Randall M. Dole; Ronald G. Prinn
Council Delegate: Lynn D. Talley

Section on Biological Sciences
Chair Elect: Gary Felsenfeld
Member-at-Large of the Section Committee: Nancy J. Cox
Electorate Nominating Committee: Deborah E. Goldberg; Anna Marie Skalka

Section on Chemistry
Chair Elect: Alison Butler
Member-at-Large of the Section Committee: Bruce A. Parkinson
Electorate Nominating Committee: Peter C. Ford; Hilary A. Godwin

Section on Dentistry and Oral Health Sciences
Chair Elect: Barbara D. Boyan
Member-at-Large of the Section Committee: Susan K. Avery

Committee: Susan Kinder Haake
Electorate Nominating Committee: Susan Reisine; Bjorn Steffensen
Council Delegate: Jacques E. Nör

Section on Education
Chair Elect: Judith A. Ramaley
Member-at-Large of the Section Committee: Susan Rundell Singer
Electorate Nominating Committee: Anne E. Egger; Gerald R. Van Hecke
Council Delegate: Arthur Eisenkraft

Section on Engineering
Chair Elect: John L. Anderson
Member-at-Large of the Section Committee: J. Gary Eden
Electorate Nominating Committee: Margaret Murnane; Sarah A. Rajala

Section on General Interest in Science and Engineering
Chair Elect: Sharon Dunwoody
Member-at-Large of the Section Committee: Katarina Nordqvist
Electorate Nominating Committee: Kathleen M. B. Boomer; Kathryn E. Perez
Council Delegate: JoAnn M. Valenti

Section on Geology and Geography
Chair Elect: Glen M. MacDonald
Member-at-Large of the Section Committee: Paul H. Glaser
Electorate Nominating Committee: Kenneth P. Kodama; Ester Shtein

Section on History and Philosophy of Science
Chair Elect: Jeannette C. Charles
Member-at-Large of the Section Committee: Sandra D. Mitchell
Electorate Nominating Committee: Hanne Andersen; Alan E. Shapiro

Section on Industrial Science and Technology
Chair Elect: Cammy R. Abelnath
Member-at-Large of the Section Committee: Sandra D. Mitchell
Electorate Nominating Committee: Daniel J. C. Herr
Council Delegate: Richard Broglie; Gordon D. Jarvinen

Section on Information, Computing, and Communication
Chair Elect: Francine Berman
Member-at-Large of the Section Committee: Christine L. Borgman
Electorate Nominating Committee: Barbara Simons; Eugene H. Stafford
Council Delegate: Michael R. Nelson

Section on Linguistics and Language Science
Chair Elect: John A. Goldsmith
Member-at-Large of the Section Committee: Joan A. Sereno
Electorate Nominating Committee: Karen E. DeMorrow; Maria Polinsky
Council Delegate: D. Terence Langendoen

Section on Mathematics
Chair Elect: Jill P. Mesirov
Member-at-Large of the Section Committee: Joceline Lega
Electorate Nominating Committee: James Crowley; Linda Petzold

Section on Medical Sciences
Chair Elect: Ann M. Arvin
Member-at-Large of the Section Committee: Arturo Casadevall
Electorate Nominating Committee: Douglas D. Richman; Guy A. Zimmerman

Section on Neuroscience
Chair Elect: David M. Holtzman
Member-at-Large of the Section Committee: Amita Sehgal
Electorate Nominating Committee: Karen Hsiao Ashe; Jeanne M. Nerbonne

Section on Pharmaceutical Sciences
Chair Elect: Sidney D. Nelson
Member-at-Large of the Section Committee: John R. Cashman
Electorate Nominating Committee: Maria Croyle; Barbara E. Hayes
Council Delegate: Jeanette C. Roberts

Section on Physics
Chair Elect: Allen Goldman
Member-at-Large of the Section Committee: Edmund Bertschinger
Electorate Nominating Committee: Malcolm R. Beasley; David K. Campbell

Section on Psychology
Chair Elect: Richard J. Davidson
Member-at-Large of the Section Committee: Janice K. Kiecolt-Glaser
Electorate Nominating Committee: Nora S. Newcombe; Michael Rugg

Section on Social, Economic, and Political Sciences
Chair Elect: Craig Calhoun
Member-at-Large of the Section Committee: Julia Lane
Electorate Nominating Committee: Wendy Baldwin; Cecilia L. Ridgeway

Section on Societal Impacts of Science and Engineering
Chair Elect: Peter D. Blair
Member-at-Large of the Section Committee: Anne Fitzpatrick
Electorate Nominating Committee: Christopher Hill; Dena Plemmons
Council Delegate: C. K. Gunsalus

Section on Statistics
Chair Elect: Mitchell H. Gail
Member-at-Large of the Section Committee: Alan F. Karr
Electorate Nominating Committee: Charmain Dean; Larry Wasserman
Council Delegate: Paul P. Biemer

ASSOCIATION AFFAIRS

Additions to 2010 Fellows

The following names were inadvertently left off the list of 2010 AAAS Fellows published in Science on 28 January.

Section on History and Philosophy of Science
Diana Kormos-Buchwald, California Institute of Technology

Section on Information, Computing and Communication
Abraham Silberschatz, Yale Univ.