



NATIONAL ACADEMY OF ENGINEERING

The National Academies of Sciences, Engineering, and Medicine

C. D. Mote, Jr.
President

September 19, 2016

Dear Colleague:

Throughout human history, engineering has driven the advancement of civilizations. Yet for all of these advances, the century ahead poses challenges as difficult as those past. In 2008 the National Academy of Engineering (NAE) convened a committee of experts from around the world—some of the most accomplished engineers and scientists of our generation—who proposed a 21st century vision for “*continuation of life on the planet, making our world more sustainable, safe, healthy, and joyous.*” They identified 14 goals needed to achieve that vision—called the Grand Challenges for Engineering. Examples include *restore and improve urban infrastructure, provide access to clean water, and make solar energy economical.*

The NAE Grand Challenges for Engineering are a magnetic global call to action that engages universities, high schools, youth, and professionals alike in engineering and reaches international communities like no other initiatives because all people can see their local needs in them. The Grand Challenges for Engineering is an international movement led by the NAE that inspires students to pursue engineering careers and to tackle major issues facing everyone. We must continue to facilitate this growing momentum and enhance engineering education that prepares students to participate in, and ultimately lead solutions of the Grand Challenges and problems like them. Please join me in making a gift to the NAE Independent Fund this year.

The Grand Challenges Scholars Program (GCSP) is an NAE-led, supplemental education model designed to prepare students for global problems. The brilliance of the GCSP is that it defines a set of five student competencies for acquisition rather than to satisfy “a program curriculum.” Every university, anywhere on the planet, can determine how its students will achieve these competencies. The GCSP competencies are: (i) a mentored research/creative project experience on a Grand Challenge-like topic; (ii) engagement in multidisciplinary learning through hands-on experience; (iii) experience in business model creation needed for implementing viable solutions; (iv) multicultural understanding needed for viable solutions in other cultures; and (v) development of social consciousness since the Grand Challenges are about serving people.

Engineering creates solutions to problems and the GCSP directly links engineering to people and society thereby introducing an educational paradigm with the capacity to move undergraduate STEM education toward the “essence of engineering.” According to one Grand Challenges Scholar:

The Grand Challenges are a list of “dares” from an older generation to ours. We are dared to reverse engineer the brain, we are dared to secure cyberspace, we are dared to prevent nuclear terror. This list is about ... the pursuit of something that will last beyond our lifetimes, and trickle down in the history lessons taught to future generations. The GCSP appealed to me because of its interdisciplinary approach ...many engineering programs across the country focus only on academics, and if students are lucky, a research or industry component too. As a member of the GCSP, I’m required to have academic, global, research, service, and entrepreneurial components to my [education].

The Grand Challenges Scholars Program is rapidly developing in U.S. engineering schools where about one-third of engineering deans (120+) have committed in a letter to President Obama to graduating more than 20,000 Grand Challenges Engineers over the decade, a phenomenal commitment for a grass-roots, unfunded, transformational program. Additional programs are under development both in the U.S. and around the world. Over half of the students in the GCSP are female, and underrepresented minority students

are also well represented in the GCSP. The GCSP is thus poised to become a major reform model for US engineering education in the 21st century.

Next month, the NAE is organizing the first annual meeting for the GCSP to be held in conjunction with the White House Office of Science and Technology (OSTP). The meeting will brainstorm next steps for the program and facilitate its implementation in the U.S. Sharing best practices, building GCSP momentum, enhancing program visibility, connecting to K-12 education, strategies for corporate and foundation engagements are agenda targets for the meeting. And of course it will showcase areas in need of programmatic support. The grass-roots effort will organize under the NAE without losing its entrepreneurial spirit.

If you think that I am excited about this NAE challenge, you are correct. Your philanthropy is needed to support creating a unified GCSP blueprint in engineering education to develop a strong engineering workforce. This is a top-priority for fundraising at the NAE. We must advance this opportunity now.

The 3rd Global Grand Challenges Summit, co-sponsored with UK Royal Academy of Engineering and the Chinese Academy of Engineering, is scheduled for July 18-20, 2017 in Washington, DC. The summit will bring together leading engineers, artists, economists, designers, philosophers, scientists, politicians, industry leaders, educators, policymakers, and students from around the world to discuss our progress on the Grand Challenges and on our education efforts. It is a singular opportunity for the U.S. to showcase national pride in engineering and our continued commitments to engineering leadership and achievements. The themes of the summit are sustainability, health, security, public engagement, education, and joy of living.

Please join me in contributing to the NAE missions of the Grand Challenges for Engineering. Annual member dues and the NAE's endowment are not sufficient to carry out these activities. Together we have an opportunity to excite and attract young people to engineering and creatively address major engineering challenges of our time. Your gift and your participation will truly make a difference.

Yours sincerely,

A handwritten signature in blue ink, appearing to read "C. D. Mote, Jr.", written in a cursive style.

C. D. Mote, Jr.

P.S. If you are attending this year's annual meeting, please mark your calendar for the popular Financial, Estate, and Gift Planning seminar held over brunch on Sunday, October 9th. See you there.