

Foreword

Leadership has long been considered to be either a nebulous, ill-defined term, or else one that conjures up a rigid, militaristic command-and-control framework. During the last 10 or 15 years, however, the academic community, especially in business and engineering programs, has recognized the importance of imparting knowledge, understanding, and skills for leadership to their students. They have come to better understand that individuals are not simply born as leaders, but gain their skills through experience and observation. Educators can enhance the opportunity for such experiential learning, and can apply in a disciplined way what scholars and practitioners have learned about leadership.

Leadership on the part of engineers is increasingly important, not just for individual success, but because 21st century engineers must contribute centrally to meeting grand human challenges of water, food, energy, climate disruption, health, and security. They also must lead the design, development, production, and deployment of products in a highly competitive global market that demands unprecedented speed, robustness, and efficiency.

My own view is that engineering leadership derives from respect for people, ideas, and things; and that it requires both sound values and technical expertise. Men and women can become leaders in engineering through advancing technology, through teaching, and through innovation. They can also become leaders in other endeavors through the application of engineering principles and practice, e.g. as businesspeople, entrepreneurs, or leaders in politics and society.

The National Academy of Engineering believes that it is important to foster, recognize, and reward engineering leadership. We do so explicitly and with high visibility through the *Bernard M. Gordon Prize for Innovation in Engineering and Technology Education*. This Prize, one of the country's major awards, recognizes educators who develop effective engineering leaders.

It is therefore a pleasure to introduce this issue of the *STEM Education Journal*, that presents the work and findings of deeply dedicated educators who work to define this emerging field of engineering leadership education.



Charles M. Vest is president of the U.S. National Academy of Engineering and president emeritus of the Massachusetts Institute of Technology (MIT). Dr. Vest served on the U.S. President's Council of Advisors on Science and Technology from 1994-2008 and was a member of the Secretary of Education's Commission on the Future of Higher Education. He was vice chair of the U.S. Council on Competitiveness for eight years, a director of DuPont for 14 years and of IBM for 13 years. He authored a book on holographic interferometry and two books on higher education. Constant themes throughout his career have included the quality and diversity of the U.S. engineering and science workforce; sustained excellence of U.S. higher education; global openness to the flow of people, education, and ideas; university-government-industry partnership; and the innovative capacity of the United States. He holds thirteen honorary doctoral degrees and received the 2006 National Medal of Technology.