WHY SOCIAL SCIENCE?

Because Engineering Is Intended to Benefit Society

March 23, 2021

By John L. Anderson, President, National Academy of Engineering

Why introduce the social sciences into engineering education and practice? The intent of engineers is to "do good" – to improve the quality and security of life. Unfortunately, it doesn't always work out this way, often because of a lack of appreciation by engineers of how technology affects and is used by people. For example, a new technology might promise and deliver great benefit to portions of society but harm certain groups. We call such results "unintended consequences."

Examples of unintended consequences abound. Social media connect people and cultures, but they are also weaponized to marginalize individuals based on race, culture, and personal attributes and to spread false information. Remote learning and teleworking, essential in the age of Covid-19, have widened the gulf between the haves and have-nots. The potential benefits of artificial intelligence (AI) to society will be blunted if human biases find their way into coding. In designing urban infrastructure, economic and technical criteria should be balanced against social impacts, such as the isolation of underprivileged neighborhoods after the construction of a new highway or transit system. Good engineering cannot be separated from social awareness and deliberate consideration.

"Good engineering cannot be separated from social awareness and deliberate consideration."

Engineers should accept more responsibility for considering potential unintended consequences of their work and seek to minimize the possibility of their occurrence. A start in this direction would be integration of the social sciences into engineering curricula. The key word here is "integration." Many engineering students now take courses in the social sciences to satisfy bean-counting requirements;

however, there is little connection made between these courses and the teaching of engineering subjects. I encourage educators in both the social sciences and engineering to collaborate to achieve this desired integration of ideas and student participation, especially in team projects. Students from both disciplines would greatly benefit by learning from each other, as would the faculty members who sew together the course syllabus and provide the instruction. Students majoring in the social sciences might discover interesting technological issues of societal importance while engaged in projects with engineering students. Likewise, engineering students would learn to value the social dimensions of innovation and gain a heightened awareness of potential unintended consequences of their work on both society and our environment.

"I encourage educators in both the social sciences and engineering to collaborate to achieve this desired integration of ideas and student participation, especially in team projects."

We should be well past the days when the development of technology is separated from human needs, desires, and behavior. This is why engineers should engage with the social sciences, and vice versa.

JOHN L. ANDERSON became president of the National Academy of Engineering in July 2019. He was previously Distinguished Professor of Chemical Engineering and president (2007–2015) of the Illinois Institute of Technology (IIT). Before that he was provost and executive vice president at Case Western Reserve University (2004–2007), following 28 years at Carnegie Mellon University, including 8 years as dean of the College of Engineering and 11 years as head of the Chemical Engineering Department. He began his career as a member of the Cornell University faculty (1971–1976). Dr. Anderson was elected to the NAE in 1992. He is a fellow of the American Academy of Arts and Sciences and American Association for the Advancement of Science, and he was appointed to the National Science Board in 2014. Dr. Anderson received his undergraduate degree from the University of Delaware in 1967, and MS and PhD degrees from the University of Illinois at Urbana-Champaign in 1969 and 1971, all in chemical engineering. He is married to Patricia Siemen Anderson. They have two children and five grandchildren.