Raise the Bar—It’s Time for Change

I was in Panama recently, and while I was there the last space shuttle, Discovery, flew over ASCE’s headquarters, in Reston, Virginia, on its way to retirement at the National Air and Space Museum’s Steven F. Udvar-Hazy Center nearby. I learned about it by reading the New York Times on my iPad. It’s amazing to consider how technology has transformed our world.

As a structural engineer I remember how, several decades ago, when a state department of transportation decided to build a bridge, it would acquire the land and simply go build it. Today it’s very different. Engineers are now much more involved with the public, seeking to find out what the public wants, where they want it, and how to meet these needs. Engineers are also much more involved in the overall picture. It’s not just about the road. It’s not just about the transportation infrastructure. It’s about the community. It’s about the environment. It’s about meeting the public’s needs. The profession has changed because working on infrastructure projects today has become much more complex. Tomorrow will be even more complex.

It’s ironic that as technology has rapidly advanced over the past 60 years, bringing us space shuttle launches, new infrastructure, and digital tablets, the number of credit hours that an engineer wishing to become licensed must possess has actually declined. For example, in the mid-1970s engineers typically needed 135 to 140 semester hours to earn a bachelor’s degree in engineering; today the total is closer to 120 credits. That’s because to an increasing extent state mandates are calling for all undergraduate programs to be funded only to a certain number of credit hours. Unfortunately, university engineering programs are not in a position to reverse this trend. Less educational preparation for an increasingly demanding profession is not good.

Employers of engineers understand the need for additional education. Some of the big firms have in-house universities because a better-educated engineer provides a better return on investment. And owners of small and midsized firms—for example, Aldrich + Elliott, P.C., of Essex Junction, Vermont, which specializes in water resources engineering—agree. As Bradley Aldrich, P.E., F.ASCE, states, “When we recruit and hire new engineers, we are looking for that additional educational experience.”

For the engineering business of the future to thrive, its engineering staff will need to be conversant with the latest technologies. This knowledge is most efficiently gained in a classroom setting before the prospective engineer enters practice. Continuing education is necessary but generally does not offer the essential depth required. Moreover, professional engineers with enhanced technical, leadership, communications, and business skills will give the profession more effective project teams, leading to better operations and better service to clients. It’s simply good for business. Highly qualified employees provide better solutions, make fewer mistakes, and deliver improved efficiency. Better-prepared professional engineers can only improve the “standard of care” and will lower risks for engineering companies. The focus on additional education will also encourage our young people, who will be the engineers of the future, to continue their pursuit of knowledge and to learn all they can about the technological, professional, and business innovations that will help them protect the health, safety, and welfare of the public.

Engineering stands apart from the other learned professions when it comes to the years of education required for entering professional practice. The fields of law, medicine, architecture, accounting, pharmacy, and occupational therapy have all raised their educational standards to meet the complexities of a new world. These professions recognize the need to address the expanding body of knowledge by requiring education beyond the bachelor’s degree. Making such a change for engineering would also serve to raise the stature of engineering. That’s not just a cosmetic demand; it’s a critical necessity.

What about the world outside of the United States? Global competitors are moving toward advanced educational requirements. In talking with colleagues in the United Kingdom, I learned that the minimum qualification for becoming a chartered engineer is a master’s degree in engineering. The same is happening in Ireland, so U.S. engineering businesses will need similarly qualified engineers if they are to compete in the global marketplace. Engineers around the globe are waking up to what it takes to compete.

A number of engineering organizations have voiced concerns. The National Academy of Engineering report The Engineer of 2020 put it this way: “It is evident that the exploding body of science and engineering knowledge cannot be accommodated within the context of the traditional four-year baccalaureate degree.” And the National Council of Examiners for Engineering and Surveying, which represents state engineering licensure boards across the country, has approved a model law that defines the minimum educational requirements for engineering licensure as a bachelor’s degree in engineering from an accredited institution and either a master’s degree or the equivalent through 30 additional credits from graduate or upper-level undergraduate courses in engineering, science, mathematics, and professional practice topics. The provisions of this law would not go into effect earlier than 2020. Both ASCE and the National Society of Professional Engineers support these efforts to raise educational requirements before licensure.

In the past 60 years, the world has indeed changed. It’s time that we in engineering keep pace with these changes. Visit the new site www.RaiseTheBarForEngineering.org and view the video showcasing important leaders in our field discussing why they believe raising the bar is important for the future of U.S. engineering. I encourage you to support efforts to raise the bar. Help us elevate standards and thereby give engineers the background they will need to contribute to the global society of tomorrow.

—ANDREW W. HERRMANN, P.E., SECB, F.ASCE