

# Engineering Education and Workforce

**F**or the last two decades, the electronics industry has been unique in that its predominant feature is its constantly changing and fast-paced nature. It is also unique in its challenges and its potential rewards to the workforce. As our industry faces increasing global competition and technological evolution, many have prospered handsomely, while others

Engineering is a powerful force.

A healthy engineering workforce is an informed workforce as the result of a sound formal engineering education, continued training and constant learning. As for the issue of formal education, it is not a particularly demanding task for a school to deliver specialty courses or core subjects. However, it takes foresight to make the right decisions to offer a proper balance

neering education, while fostering the ability to cope with real-world demands. A premium education comes from those school systems that offer curricula integrated with industry interaction and in sync with the market needs. For example, the programs are designed to give graduates a mix of skills (e.g., the ability to deal with customers/clients, handle contracts, help close the deal, work with others, etc.) in addition to the technical specialty. Programs range from coaching teamwork and tackling manufacturing problems to building written and verbal communication and business negotiation acumen. The ability to adapt and change is also pivotal for success in the future workplace's global intellectual platform.

Having traveled 100,000 air miles a year for the past 20 years, I appreciate and have fully benefited from the global exposure to businesses and cultures as well as science and technology. There is a time for all to give back, and I am happy to be in the position to set up an endowment fund at my alma mater in support of educational programs. I have focused on some issues that are historically less funded. My top two reasons are to fund enrichment activities that require international travel for university faculty and students, and to encourage technology transfer of inquisitive inventions and discoveries from university campus to actual commercial applications.

On an individual basis, an engineering graduate with only technical training will not be construed as the best candidate for a job. A well-versed professional possessing both technical depth and intellectual breadth will be in high

**"A well-versed professional possessing both technical depth and intellectual breadth will be in high demand."**



have lost ground. One of the building blocks of this technologically challenging industry is the availability of a skilled and educated engineering workforce.

The broad meaning of engineering is a bridge between science and society, taking discoveries and putting them into practical use for the betterment of life. This reflects not only the genuine spirit of the engineering mission but also the wide scope of the engineering practice.

When we look around, the relentless proliferation of high-tech products, be it portable computers or mobile electronic gadgets, has changed the way we live, work and play. We recognize that these products are designed with essential principles and practices of engineering. Our industry is the backbone of these marvelous products, and for the part we play, we should be pleased. As the National Academy of Engineering (NAE) explains:

between the core courses that are mandatory for all engineering majors and the selective courses that fit current and future needs. Basic science and math courses form the foundation that is crucial to any engineering discipline and should not be replaced. The offerings in specialty courses pave the groundwork for the life-long ability to acquire new knowledge.

An expected change in engineering education is meeting the increasing demands in versatility and diversity of skills and knowledge that graduates need to manage their future jobs and career development. School curricula needs to prepare the students for their professional specialty. Equally important is equipping the students with diverse intellectual acumen above and beyond the specialty.

Some engineering colleges have launched programs that provide students with a science and engi-

## Materials & Production

demand. With the increasingly shorter product cycle and time-to-market, the ability to learn is no longer an attribute, but a necessity. For some (if not all) who are still keen about their compensation package, a human resource department often specifies "...The compensation package will be commensurate with experience and skills ..." In this changing and challenging time, what one earns depends on what one learns and how

fast they do it. This translates into the level of contribution one can truly make in a timely fashion.

From the business (employer) side, it is imperative that the workforce be able to understand how and why the process works and follow procedures. In the meantime, the ability to innovate is equally available. It is also increasingly important that engineers are able to grasp new technologies. Inevitably, companies are

required to provide timely training to existing and new workers. The "pipeline" issue has recently drawn close attention. Asking whether there is an adequate supply of educated engineers is a legitimate question. The answer largely depends on whether there are sufficient high school and college graduates entering the education and training end of the pipeline. To run a successful business, cost control/reduction is an eternal objective. Every level of the workforce will be more closely linked to "cost." As a whole, a cost-conscious workforce accounts for the effectiveness and efficiency of an operation. Another growing factor is workforce diversity, particularly in engineering disciplines. Diversity facilitates the creation of new markets and enhances the adaptability to the ever-changing market. A diverse workplace enriches the quality of intellectual discourse and encourages a variety of thoughts and ideas. Managing a diverse workforce to leverage all talents and engage all employees becomes a prerequisite to maximizing productivity, and thus competitiveness. **SMT**