

Partnering for technological literacy

~ by Ioannis N. Miaoulis

Technological literacy is critical for our country to maintain its global technological lead and standard of living. As consumers, citizens, and workers, we must be able to make informed decisions about the new technologies shaping our lives. With our reliance on engineers and technical workers from abroad, there is a real concern about the possible consequences for our economy and national security. Technological literacy would give our youth a head start as innovators—whether in engineering, technology, education, or business.

Unfortunately, K-12 students are not learning the engineering skills they need to be technologically literate—able to appreciate and know how technology is created, to feel comfortable with engineering activities, designing and figuring out solutions, and to make judgments about technology. Less than 15% of United States high school graduates have enough math and science to pursue scientific/technical college degrees; almost half who begin engineering courses drop out in the first year; less than 2% of US high school graduates go on to earn engineering degrees (reported in the November

2002 American Society for Engineering Education publication *Prism*).

In 2000 the International Technology Education Association took an important first step by publishing standards describing what people should know and be able to do in technology and engineering. In 2001 Massachusetts became the first state to mandate engineering in its K-12 public school curriculum. And in 2002 the National Academy of Engineering published an influential report presenting the need for technological literacy, calling for changes in both the nation's schools and informal educational institutions where people no longer in school can learn about technology and engineering.

As Dean of Tufts' School of Engineering, I helped introduce engineering into the Massachusetts science and technology curriculum because I believe that engineering activities foster the problem-solving and design skills necessary to succeed in a technological world.

No one understands the need for technological lit-

eracy better than the high-tech industry. Who better to lead the way? Massachusetts' first-mover status in K-12 engineering offers an extraordinary opportunity for companies and museums to work together to foster technological literacy. Whether through financial support, in-kind equipment donations, loaned technological expertise, internships, training, or volunteering, your company's employees could take pride in knowing they have made a real difference in their communities.

In a hub of research and innovation, the Museum of Science can help catalyze a statewide and national expansion of technology literacy by *working with schools* to modify their curricula, training educators to implement the standards, and by *fostering lifelong learning* through the presentation and informed discussion of scientific and technological advances.

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Through a recent federal appropriation, the Museum is starting to develop programs and exhibits for a National Center for Technological Literacy. Our model will provide:

- ❖ a window on emerging technology through partnerships with high-tech companies, universities, hospitals, and labs
- ❖ a dynamic environment to engage people in design, engineering, and invention activities
- ❖ forums on science and technology issues of our times
- ❖ technology to optimize the visitor and virtual visitor experiences
- ❖ a distance learning facility, infused by exciting Web-based and other activities, for students, educators, and other adults.

Working now with Tufts School of Engineering on distance learning, the Museum calls upon technology companies and universities to join us in fostering technological literacy statewide. The cornerstone could be the Museum Web site www.mos.org which would link to www.PreK-12engineering.org/ (now under development). A vibrant Web resource could enhance educators' knowledge of technology/engineering activities in line with the new standards through courses, tutorials, forums, expert advice, curricular and learning management tools, and face-to-face workshops. The program could be expanded nationally by designing portable educational modules and professional development tools and by creating a model of how science museums and universities that can partner with industry in each state.

Company employees could volunteer to put their engineering skills to work helping develop engineering curricula, online tools, or videos. They might inspire teachers, students, and the general public volunteering as Museum interpreters or in school classrooms and labs, introducing hands-on engineering and design activities. They could participate in a Museum forum on a controversial issue prompted by new technologies or offer a first-hand look at real engineers at work in their laboratories.

As Boston's most-attended cultural institu-

tion, the Museum draws 1.6 million visitors a year. Of those, 250,000 are school children and teachers, mostly from Massachusetts. Building on our strengths as one of the largest centers for interactive science exhibits and programs, the Museum has already begun the work of promoting technological literacy. Thanks to these partnerships:

- ❖ A fiber optic link to NECN permits live cablecasts of breaking news reports from our Current Science & Technology Center
- ❖ A Science Education Partnership Award from the National Institutes of Health's National Center for Research Resources enables partners, including Harvard School of Public Health, Whitehead Institute for Biomedical Research, and Massachusetts General Hospital, to bring an impressive roster of scientists and engineers to the Museum in the Frontiers of Health Science Series
- ❖ With the MIT Media Laboratory and Intel Corporation, our Computer Clubhouse program, an award-winning, out-of-school learning environment, serves thousands of inner-city youth who use technology creatively with adult mentors worldwide

The country is watching Massachusetts.

Join us!

