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GETTING UNIVERSITY-INDUSTRY RELATIONS RIGHT

CONCERN about the decline in performance of U.S. industry relative to foreign competition has created a demand for more collaboration between universities and industry. The resulting new activities not only broaden the fundamental mission of the university from the acquisition and dissemination of knowledge to its application but also present to universities their most exciting intellectual opportunity in decades.

But this burgeoning attention to university-industry cooperation also raises important questions about ownership of intellectual property, publication policy, and open access to research in progress. Conflict-of-interest questions come up, too; in biomedical research, for example, there is growing concern about faculty who consult for companies on topics related to their industry- or government-sponsored research. Unfortunately, much of the current public debate on these new collaborations focuses unduly on these problems and not enough on the long-range opportunities.

The new interest in university-industry relations has arisen because U.S. industry has seemed unable to translate new technology into quality products. This concern is heightened by the increasing speed with which certain critical technologies--electronics, materials, and biotechnology--must progress from invention to commercial production if they are to succeed in the market.

Awareness of this shortcoming has led to significant responses from universities, industry, and government. Industry is showing greater interest in collaborating with universities, especially in rapidly developing fields that look economically rewarding. MIT, for example, receives industry support for research on high-temperature superconductivity, manufacturing technology, and biotechnology. The government encourages such collaborations, and increasingly justifies programs on the basis of their contribution to the competitiveness of U.S. industry.

Spurred by these changed circumstances and by the expressed national need, research universities are beginning to formulate new education and research programs. Such programs, often underwritten by industry, offer a new pathway that motivates and prepares students for the application, not just the creation, of new technology.

Instead of concentrating exclusively on a particular academic discipline, students following this new pathway address major technology applications and manufacturing issues in a way that integrates design, engineering, and production management. One example is the MIT Leaders for Manufacturing Program, a collaboration between MIT's schools of engineering and management and 12 companies that sponsor joint research and education to improve the use of technology.

One problem with these collaborations stems from the federal government's attitude toward them. Many university-based research programs focus on emerging technologies that have long-term commercial potential. But in attempting to justify their budget requests to Congress, agencies oversell the potential for quick payoff. This emphasis can hamper creative collaborations. Both the Department of Energy and the National Science Foundation, for example, stress technology transfer to industry as a principal aim of their research programs. As a result, Congress naturally finds it reasonable to restrict access to such research projects by foreign students and companies, and has confined its debate to protectionism and potential conflicts of interest.

It is time for Congress to redirect this debate to the long-term benefits that can come from university-industry collaborations--as well as from joint projects involving government laboratories. We need legislation that encourages greater cooperation among these three sectors. In addition, universities should set specific goals for increasing their work with industry. MIT, for example, now gets about 12 percent of its funding for on-campus research from industry. A reasonable target would be to raise this to 25 percent over the next 5 to 10 years.

Policymakers should recognize that these collaborations will yield long-term benefits only if certain simple standards are met. One is that the research have potential for technology transfer. More important, the research must seek advances in basic understanding. Finally, the industry-sponsored project should have a significant education component. One collaboration that meets these criteria is the program to study the use of high-temperature superconductors for electronics, which MIT has undertaken in partnership with IBM and AT&T.

For their part, universities--not government--should establish clear rules to preserve the openness of the research process and to avoid conflicts of interest on the part of faculty. If U.S. industry and universities work together to establish joint R&D programs that meet these standards, I am convinced that the nation will benefit greatly.

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