



MIT Vice President for Research and Development Prof. David Litster (USA)

Surprises in the Research University-Society Relationship

Increasingly hard to predict, promote and protect, educational excellence and its impact are becoming more important than ever.

Everyone knows that "somehow" academic research is good for a nation's economy, international standing and quality-of-life. But research universities, the source of many new scientific discoveries, are only part of a much larger national innovation and "social capital" system. The workshop's participants shared many examples of how strong, but also how complex and subtle, these interconnections can be. For example, Prof. David Litster, Vice President for Research and Development at the Massachusetts Institute of Technology (MIT), noted that the recent decrease in U.S. defense-related research funding had little impact on university History departments, but may significantly affect advanced academic research in Electrical, Mechanical, Materials and Computer Engineering, 60% of whose federal support is defense-related.

Dr. Al Teich, Director of Science and Policy Programs at the American Association for the Advancement of Science (AAAS) pointed out that over half of all U.S. federal funding for academic research now comes from the National Institutes of Health (NIH). As a result, while other fields struggle, the U.S. Life Sciences have "taken off," with the brightest, most ambitious students and young researchers going to where the funding is. Although none of these funding decisions were made for reasons related to higher education, they have had significant, unintended effects on U.S. academic research, nonetheless. Further study of such unexpected resonances in other countries, including Israel, seems warranted.

While some observers see industrial funding as a source of economic deliverance or intellectual deterioration, most workshop participants agreed that industry is neither a big bad wolf nor a fairy godmother. In Litster's experience, properly structuring the relationship can avoid most ethical problems. He also foresees no decrease in research excellence, because excellence is precisely what industry wants from universities. It particularly wants excellent students and will pay for excellent

academic research if that helps develop a special relationship with them.

On the other hand, while university-held patents are numerous, they do not directly bring in that much money. In contrast, the patents and new high-tech companies of successful graduates can bring in large donations and bequests much later. Israel's research university system may unexpectedly benefit from such developments in the future.

Nor are universities a passive partner. They affect society too. Litster points to a 1997 Bank Boston study which reported that MIT faculty and students have founded over 4,000 companies, employing 1,100,000 people, with gross sales of \$232 billion a year! Some 80% of these new jobs are manufacturing

jobs (compared to the 16% U.S. average). The 1,065 Massachusetts firms alone have worldwide sales of \$53 billion a year and provide 5% of all Massachusetts employment. These benefits are surprisingly non-localizable. For example, MIT-related firms have created more jobs in California (162,000) than in Massachusetts (125,000)!

The impact of a research university education on society is, in fact, no easier to predict than the impact of society on research university education. For example, Litster noted that 40% of all MIT-related biotech firms were founded by ambitious Engineering graduates, while only 18% were founded by Life Science graduates! Conversely, Social Science graduates founded 26% of the MIT-related computer software companies. Thus, the major benefits of a high-quality university education seem to accrue from the enhanced personal qualities of the graduate, with problem-solving and competitiveness skills being at least as important as the transfer of subject matter. This argues for the wide ranging, formal and informal education provided by today's research universities. Increasingly hard to predict, promote and protect, educational excellence and its impact are becoming more important than ever.