

The Role of Uncle Sam— and You—in Fundamental Research

One of the most difficult problems today in Washington is addressing the challenge of a knowledge-based economy coupled with increasing competition from other nations. Federal agencies, the National Academies, and think tanks are all skilled at identifying problems and recommending policy solutions. Most everyone agrees that to remain internationally competitive we have to strengthen our science and technology talent, improve math and science education, and foster a business environment friendly to innovation. However, the stakeholders responsible for those solutions are not always delineated. At times this contributes to diffused responsibility with everyone thinking someone else will fix the problem.

Despite this confusion, it remains clear that the federal government is one of the most influential stakeholders, and one that has an important role to play in addressing these challenges. Put simply, the responsibility of the federal government is to stimulate innovative research that directly links to a healthy economy. Federal policy should lay the groundwork for fertile discovery and innovation, without setting too many parameters that might squelch the freedom necessary to produce such results.

Federal investment in science and technology has yielded life-changing payoffs. New analysis from the Bureau of Economic Analysis shows research and development accounted for a substantial share of the resurgence in U.S. economic growth in recent years. Yet even in the face of these encouraging statistics, the general public, and, indeed, many members of Congress, still fail to consider funding for fundamental research a top priority. For proof of this, we need look no further than the budget for mathematics and physical science research at the National Science Foundation (NSF), which has generally grown at a rate less than inflation and has even endured real cuts in recent years.

The question is, then, how can we increase federal funding for research? Before we can increase federal funding for research, we must first convince others of the necessity of doing so. Fortunately, there are signs that this is already beginning to happen. In Congress the discussion on this topic has gone from virtually nonexistent to a modest din. In fact, President Bush spoke eloquently in his 2006 State of the Union address on the connection between science and technology and U.S. economic competitiveness. More importantly, his words were backed up with significant funding increases requested for the National Science Foundation, the Office of Science at the Department of Energy, and the laboratories of the National Institute of Science and Technology.

But many of my colleagues in Congress are still not among the converted. Every member of Congress is in favor of science and technology in the abstract, but when

it comes to distributing federal dollars, science is often crowded out by other concerns. In light of these challenges, I have found it to be an extremely tough job being a “missionary” for science and math.

What of the other stakeholders? What roles do they play? The federal government is not alone in its responsibility for research and development funding. While higher education has always been a federal priority, it is primarily the responsibility of the states to maintain educational institutions that become the breeding ground for seminal research. Universities are able to identify promising faculty members with both research and teaching strengths. But for new faculty, finding initial funding can be tough, especially when federal agency budgets are tight. Recent legislative proposals have attempted to address this through establishing grants targeted at early investigators.

The private sector also plays an important role in maintaining the science and technology enterprise. All stakeholders share the challenge of leaping over the so-called “valley of death” that often plagues institution-level research discoveries that do not have a pathway into the marketplace. The process of translating foundational research into fully realized technologies has improved, but tech transfer programs at universities need the support of the private sector to fully realize academic entrepreneurship.

State and local entities share the responsibility of educating our youngest children. In order to compete globally, we need a constant stream of innovative ideas originating from U.S. scientists. This starts in our K-12 institutions, where children are introduced to math and science. To do this, we must improve our curricula, equip our teachers with the knowledge of quality content and pedagogy, and support educational research to expand our knowledge of how children best learn math and science.

The final group of stakeholders includes science, technology, engineering and math (STEM) professionals, those who are perhaps in the best position to act as advocates for STEM in communities. There are many ways to be involved in this process, from raising awareness among students, parents, and teachers at all levels, to personally encouraging members of Congress to make research funding a priority. I hope you will consider speaking with your local, state, and federal governmental leaders about the importance of research funding and STEM education.

It is only when all stakeholders are doing their part that we will be able to move past waiting for someone else to fix the problem and toward working together to create solutions.

—Congressman Vernon J. Ehlers (MI-03)
Congressman Ehlers taught physics at Calvin College for sixteen years. He represents the third district of Michigan.