



ASSOCIATION OF AMERICAN UNIVERSITIES

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Research Universities and the Future of America: A National Convocation on Breakthrough Actions

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I will not mince words today: the Federal Government is stuck in the mud, and will not get out very soon. For research and innovation, this condition has consequences, some dire, some just bad.

To take just one metric, since the publication six years ago of “Rising above the Gathering Storm,” and the subsequent enactment of the America COMPETES Act, federal support of research has not only NOT achieved the reports’ R&D investment goals, it has actually declined in purchasing power. This is a discouraging outcome.

Now we have the added impact of the sequester, an egregious failure of public policy, and the government shutdown, a clear case of dereliction of duty. The times call for good governance, but there is none. Because we are stuck in the mud here in Washington, we are fast developing an innovation deficit. As some 200 university presidents wrote in a recent letter,

“Our nation’s role as the world’s innovation leader is in serious jeopardy. The combination of eroding federal investments in research and higher education, additional cuts due to sequestration, and the enormous resources other nations are pouring into these areas is creating a new kind of deficit for the United States: *an innovation deficit*. Ignoring the innovation deficit will have serious consequences: a less prepared, less highly skilled U.S. workforce, fewer U.S.-based scientific and technological breakthroughs, fewer U.S.-based patents, and fewer U.S. start-ups, products, and jobs. These impacts may not be immediately obvious because the education and research that lead to advances do not happen overnight. But the consequences are inevitable if we do not reverse course.... “

Industry recognizes this problem as well, as evidenced by the letter from high tech association leaders of September 19, which echoed the sentiments of university leaders I just quoted.

And earlier this week, the three winners of the Nobel Prize in Medicine lamented in strong language the risks for American science of our current underinvestment in research and innovation, risks to the careers of younger investigators in particular.

But it does not seem to matter how many academic and business voices shout the same warning: few of our politicians seem to pay attention.

Given this willful disregard, I am concerned that we may not be able to count on the Congress to play an effective role in making decisions in the long-term interest of American research and innovation. The evidence for my pessimism is manifold, based not simply on the past few weeks, but on the past few years. I believe we should continue to advise and cajole and plead, because it would be irresponsible not to, but my confidence in our advocacy is waning.

What WE need to do is to try, as best we can, to insure that the COUNTRY's research enterprise is not stuck in the mud. The NRC report on research universities speaks of four key players in U.S. innovation: the federal government, the states, business and industry, and the universities themselves. The failure of the federal government even to keep up with the pace of other countries in research places greater responsibility on the states, the business community, and the universities. Here is where I think we should now put our energy. The states, after nearly a decade of defunding public research universities, are beginning to show signs of turning around. More enlightened states are reinvesting in education and research.

For this fiscal year, 2013, some 37 states increased their general fund support for public colleges and universities after years of repeated cuts. While it is true that some states continue to disinvest and to mire themselves in ideological conflicts, many are moving forward.

The State of Washington increased higher ed funding by 12%, for example, a healthy jump after years of reductions, and a good chunk of it is aimed at expanding enrollments in computer science and engineering programs. Minnesota passed additional funding for public universities designed to preclude tuition increases in the near term.

In New York, after years of overregulation, Governor Cuomo has enabled the State University of New York, for the first time in a long while, to take a consistent, multiyear approach to tuition setting.

Mayor Michael Bloomberg took the unusual step of initiating a competition for a major tech campus in New York City, complete with the promise of prime real estate and infrastructure support. And this decision came in spite of the fact that the City already had two first-rate research universities, Columbia and New York University. The Mayor saw the value of innovation based upon high-caliber research, and he fostered the development of a new campus aimed at stimulating ideas and creating new knowledge, much of which would benefit business and industry.

Connecticut has announced the Next Generation Connecticut plan to expand the number of STEM majors at its public universities, to authorize the hiring of 259 new faculty members, 200 in STEM disciplines, and to invest nearly \$2 billion in capital outlays, most of it for STEM teaching and research facilities.

These states have come to recognize that strong research universities constitute one of their most potent sources of new talent, new ideas, and social, cultural, and economic development. And

now some states are collaborating with research universities and business to jumpstart innovation.

The Georgia Research Alliance is a public/private partnership that has leveraged \$565 million of state funding into \$2.6 billion of federal and private investment. GRA Ventures has accelerated the formation and launch of university-based startups by evaluating new technologies, advancing to market over 250 university discoveries with commercialization grants, and providing low-interest loans to the most promising companies.

Michigan has created two new initiatives: one for innovation and entrepreneurship that provides matching funds for commercial readiness activities, administered by a consortium of universities; the other the Michigan Translational Research and Commercialization Program, which has awarded grants to six Michigan universities to create high-tech jobs and university spinoffs.

The State of Maryland is developing new programs to address the need for cybersecurity experts, supported by Northrup Grumman. This is part of BHEF's nationwide effort to put universities and businesses together to produce creative solutions to broad problems. Corporate leaders are now turning to universities for longer-term collaborations, not just for convenient deals, because they see the need for the development of talent and groundbreaking research.

And universities are getting smarter in creating opportunities for tech transfer. Within the past two years, the University of Minnesota and Penn State University have announced new policies for handling intellectual property arising from industrial sponsored research projects. These policies attempt to eliminate the need for protracted negotiations over IP rights by allowing businesses to pre-pay a fee, and in return the company receives an exclusive worldwide license to technologies developed at the university based upon research sponsored by the company.

Our universities need to do their part too in improving the way we educate students. One of the refreshing developments in research universities is the dramatic arrival of new online pedagogical platforms that are reshaping the way we teach students, particularly in STEM fields. The first reason to feel good about this development is that the professoriate has not devoted this much time and attention to teaching in 40 years! To see senior faculty members, including scientists, perhaps *especially* scientists, engaged in improving the way they teach is heartening, and it belies the old claim that research faculty do not care about pedagogy.

AAU is embarked on a major new project to urge science and engineering faculties to adopt the proven methods of teaching gateway courses that engage students much more directly in the learning process. I am happy to report that we have had a robust response to this initiative: half our members submitted proposals to become project sites, and we have now funded eight of them in the first round. We will soon add dozens more campuses to a new network that exploits the momentum from this early response, as well as the growing literature on active learning.

Note also that AAU universities are doing a LOT to determine student learning outcomes, in spite of what you might read in the paper. We recently conducted a survey of our members on instruments they use in order to measure student learning, and found that AAU universities are

heavily invested in this process. They do not all use the same national instruments; in many cases they make their own for the best results locally.

So we are seeing research universities adopt better pedagogy, and commit themselves to ensuring better student learning outcomes. I can think of nothing more important for the nation's future. While the *number* of degrees produced is important, the *quality* of those degrees is much more so.

To conclude: the federal government is waist-deep in mud right now. For as long as it is stuck, research universities, working with the states and the business community, must become smarter and sharper at growing talent and forming coalitions for the good of the country. I challenge all of us to execute those recommendations in the NRC report that we can address on our own, and with the help of the states and corporations. The United States needs to close the innovation deficit before it is too late. It would be nice to have the Congress with us in that effort.