

Vernon J. Ehlers

Introduction by Cynthia H. Wilbanks

I can certainly remark that one of the strengths of our region and our state lies with the profound impact that our Congressional delegation has on the deliberations taking place in Capital Hill in Washington on so many of the topics that we are going to be discussing and thinking about over the next several days. In his 14 years in Washington, Congressman Vern Ehlers, representing the Grand Rapids region, has been a powerful voice for an innovation agenda and has given support for the powerful rationale to support scientific inquiry that will lead and keep the U.S. in the global economy as a major force. He is as passionate about the importance in the imperative to invest in an innovation agenda as he is in the education of young people who will need to be proficient in math and science, and several of our speakers have indicated the reason why we must be thinking about K-12 education. Congressman Ehlers was not able to be with us today, but he joins us today via this video.

Ehlers

Good morning, I wish I were in Ann Arbor with you. I'd love to be there because I would like to hear the other speeches, but unfortunately our schedule in Congress prevents me from doing that. So let me just give you a few thoughts and talk about some of the issues that I have worked on. First of all, let me thank you for having this meeting. I don't think there's anything more important to Michigan right now than restoring its manufacturing base, but also building its university base because you can't have the one without the other. And I believe that's what your conference is about.

The consensus now exists, first of all, that improving STEM [science, technology, engineering, and mathematics] education throughout the nation is a necessity for preserving our capacity for innovation and discovery and for ensuring U.S. economic strength and competitiveness in the international marketplace of the 21st century. The National Academies' *Rising Above the Gathering Storm* report places an emphasis on the need to improve STEM education and made it's top priority increasing the number of highly qualified STEM teachers. This recommendation was embraced by the COMPETES bill developed by the committee and which was recently enacted. On the *Gathering Storm* report, I can't say enough good about it because I've been working 12 years to get something like this through the Congress. And Norm Augustine was brilliant in putting together the group that produced the full report, and I've been using that and expanding on it since.

This bill expands and enhances basic research in education in science, technology, engineering, and mathematics. It is the result of numerous reports and much effort by the science community warning that the U.S. is in danger of losing its global science and technology leadership. In addition to authorizing funding increases for physical sciences research, the bill would also extend STEM education programs within the National Science Foundation, the Department of Energy, and the Department of Education. Norm Augustine deserves credit for not only chairing the *Gathering Storm* report, but also for leading and sustaining the message of the report to leaders all over the country. For example, he has prepared another booklet, *Is America Falling Off the Flat Earth?* This of course refers to the recent book saying the earth is flat after all. He's just been a real giant in getting this together and helping because I can only do so much in the Congress, and I need help outside of the Congress, too. And I appreciate Norm Augustine's help, and that of anyone who can give it to me.

Nowhere is the role of education and innovation as evident as at the higher education level. I am sure you are all familiar with the September Michigan University Research Corridor economic impact report, which concluded that the URC system helped create almost 70,000 jobs and produced 54 percent of the

nation's science and engineering degrees, in addition to pumping billions of dollars into the state and local economies. It is high time that Michigan takes this more seriously and moves with it.

Route 128 years ago made the record for an innovation and expansion, then we had Silicon Valley in California. Michigan is overdue to capitalize on its strengths and become another Silicon Valley. As is evidenced by your conference, there is a growing understand of the need to communicate between higher education and employers. and I might add to, the legislature and the Congress. There is a great need for technical workers as well as scientists and engineers. It's not just producing scientists and engineers, although that's important. You also need the workers technically qualified, because all of the jobs of the future are going to demand a good, working knowledge of the principles of math and science.

One word of caution to you, I know you are thinking boldly about what you could do to transform the Michigan economy, and God bless you for that. I think that is laudable, but please recognize dramatic change will not happen overnight. Silicon Valley took 20 to 30 years to develop into the center of innovation and learning that it is. You should not expect there to be instantaneous change and that becomes a problem in dealing with government, because as you know legislatures want instant results from money they put into this and they have to realize, too, this takes a long time. Government and industry depend on basic research to meet future needs and generate new ideas and innovations for tomorrow.

Too often we have a divide there between the research that governments and universities do and what industry needs, and I've prepared a little chart, which I often use. It's called the Valley of Death, where you have the basic research over on this side doing very, very well, and the results which should trickle right across into research and industry just don't. It drops into the Valley of Death. And I think it's very important for us in the government sector and for you in the university sector to be aware that we have to solve that problem.

One other aspect in education, I've always told my students through the years, when you come graduate and you get a diploma, that doesn't mean it's a union card and that now you can just get a job. A diploma should be a symbol of a learning permit that you know now how to learn, you've learned how to learn and that they have to develop their skills the rest of their life. That's the only way we can remain competitive with the rest of the world.

Universities are incubators for new ideas. I think Richard Templeton, the president and CEO of Texas Instrument, said this best at a 2005 national summit on competitiveness, "The semiconductor industry invests approximately 15 percent of sales into research and development. Even with these levels of investment, we are increasingly looking to universities to address long-range research challenges we will face 15 to 20 years from today. Leadership in these areas will determine our future competitiveness." That's what industry is saying, but the sad part is that legislatures and the Congress are putting far less than 15 percent into research and we must increase our level of research if we want to keep up with the times and with the rest of the world.

Last week the House Committee on Science and Technology held a hearing on how companies decide where to locate their research and development facilities. According to the research of a witness from Georgia Tech, Dr. Jerry Thursby, the number one factor for companies deciding where to put their research facilities in developed economies was the proximity to a major research university. Companies see the most cutting edge work so tied to universities that they refuse to consider locations which don't have them. Here Michigan has a big advantage because we have very, very good universities throughout the state.

But universities also face a number of evolving challenges to remain competitive, including moving fast enough to make technology transfer relevant. Also you have the danger of the ebb and flow of support from the Congress. Some years you get a lot of support, then the budget gets bad you don't get support. We have to have a consistent, steady stream of cash and energy going into research in our nation.

U.S. higher education remains the standard of excellence for the rest of the world, but I think you will agree with me that your sustained excellence relies on the education that students receive in the K-12 public education system. In our increasingly flat world, our kids will be handicapped by a lack of STEM skills. Congress has gradually grown to understand this message, but it is not widely accepted by parents, many of whom were shortchanged by their own math and science education. If they are not using science and math skills, they see little reason for their kids to master the subjects.

I often wonder why our culture is so permissive toward science and math illiteracy but not reading illiteracy. Interestingly, students in countries that perform well on international tests say that they like math even better than students in the U.S. The perception of a hard subject does not mean that every culture accepts weakness in those subjects. It is very, very important for us to get acclimated to this, and I continually try to educate adults. I will often comment to them that I have as much right to expect them to understand the basic principles of the laws of thermodynamics and how they affect our daily life and our gas shortages, for example, as they have a right to expect me to understand the niceties of Shakespeare.

Major research universities have an often underutilized role that can dramatically influence public opinion. These universities train teachers of science and mathematics and have the capacity to train them in wonderfully rich content now. The teachers are agents of change in their local communities. Do not underestimate their power to equip and influence kids and to communicate to parents the importance of math and science. We really have to totally rethink this.

One other detail worth mentioning about the role of engaged universities, I've recently introduced a bill with a colleague from Oregon, Earl Blumenauer, which would authorize a grant program to promote programs and practices and sustainability on college campuses. Many institutions already are offering courses in sustainability, but this emerging discipline is truly interdisciplinary. Some guidance and connection to employers could be very useful to institutions by training students in sustainable business practices. Whether they end up as city planners, caretakers, or entrepreneurs, this is just another way that higher education institutions are impacting their local economies for the better and certainly not for the worse.

There is so much more I could say to you on this topic. I feel very deeply about it and very strongly that, number one, we have to increase the research funding and capability of our nation, particularly in the universities. Secondly, we have to improve STEM education, and again much of the responsibility lies on the universities and their teacher education programs and in the ongoing professional development of teachers. That's a huge need. I've worked extensively with elementary schools and elementary teachers, and I can assure you they desperately want to teach math and science well, but they have never learned it and have never been taught how to teach it. Universities sponsoring workshops, summer programs, even in-service programs during the year, trying to help teachers to understand the new developments in science and math and how to teach it properly, how to get the kids excited. That's a role that you can really play that's going to change and influence the state tremendously.

So please get busy on it. Work in all aspects of this. Help educate the teachers, help educate the students. And by the way, don't criticize the teachers. I've found them to be wonderful people who really want to teach well. And so please get out there and educate them and help them to do a good job. But also continue the strong research emphasis at the university level. Industry depends totally on it, and I've worked so hard in the Congress to try to develop that link. And I am getting more funding the universities and for programs such as MEP, the Manufacturing Extension Partnership, which will tie the universities more closely to industry that needs their help, and the ATP program, which we are trying to revive and which does more advanced technology work. All of these things are stirring in the pot. We need your help to implement them and above all your help to persuade the Congress to fund them.

Thank you very much for inviting me to speak to you. Once again I wish I could've been there. I hope this substitute works out for you, and that you get some sense of the importance of this and how dedicated

I am to doing it right. And I hope you will share in my dedication and help in this long-term project I've been working on. Thank you very, very much, best of luck to you, God bless you and good-bye.