

Stephen Fonash, Pennsylvania State University

The Nation certainly needs research and instrumentation resources such as those provided by NNIN and the National Laboratories. The further sustaining and growing of these is a necessity to retain US economic viability. Education resources are just as important, if not more so, yet this area is not even mentioned as a 2014 NNI Signature Initiative. If K-16 nanotechnology education is not a very strong point of emphasis, then the already small number of American graduate students using US research and instrumentation resources will continue to dwindle. The Europeans have created undergraduate and graduate programs in nanotechnology and the EU is now working to make the subject a part of high school education. A measure of the activity around the world can be obtained from the fact that, in the past month alone, the NSF NACK Network has received requests from UNESCO, Brazil, the Columbian government, and Russia for guidance in developing nanotechnology education programs at various levels of the K-graduate school range. If we do not even mention, much less have a plan for, nanotechnology education in the NNI Signature Initiatives, then we cannot be surprised when the Nation can add nanotechnology comprehension to mathematics and the list of other subjects for which Americans trail in world-wide testing. In the draft 2014 NNI Strategic Plan education is mentioned briefly in program component area #4; however its importance does not even rise to the level of being included in the title of this program component. In addition to adding an additional Signature Initiative focusing on the integration of education in nanotechnology I would suggest a title change for program component area #4 to "Research, Instrumentation, and Education Resources".

This country is creative in research and in education. To get the educational creativity disseminated and utilized takes (1) realization of the importance of education resources and (2) the financial support to maintain that education creativity and dissemination. Frankly, we need to have a much stronger emphasis on education. We need to have a 2014 NNI Signature Initiatives document that does not forget the urgent need for a cadre of Americans from the technician level to the graduate degree level who have the educational background needed to invigorate American industry from start-ups to major corporations.