

Testimony of Judy A. Jeffrey
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Before the House Subcommittee on Research and Science Education,
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Chairman Baird, Ranking Member Ehlers, and members of the subcommittee, thank you for the opportunity to testify today regarding the National Science Board's (NSB) action plan for science, technology, engineering, and math (STEM) education. I am testifying today on behalf of the Council of Chief State School Officers (CCSSO) and in my capacity as the Director of the Iowa Department of Education. I was also the co-chair of the Council's Math and Science Education Task Force in 2006.

Thank you for inviting me to provide a state perspective on the NSB action plan. States play a key role in developing our nation's STEM education system and have put considerable energy and resources into improving it. Just in the last year, Iowa developed new rigorous and relevant curricular expectations in science, expanded Project Lead the Way accessibility, and implemented a public-private partnership related to STEM professional development for teachers.

First, I would like to comment on the positive steps the NSB action plan is taking. The report rightly addresses state responsibility for STEM education and appropriately places emphasis on the critical need to recruit STEM teachers and develop their skills. I also agree with the report's recommendation that better coordination is needed among all federal departments and agencies involved in STEM education research and programs. State departments of education face competing requirements and priorities from different STEM education programs, so this recommendation is a step in the right direction to streamline federal programs. The action plan places needed emphasis on the federal government effectively providing and communicating research on STEM education, which is a priority for CCSSO and one of our recommendations for the reauthorization of the Elementary and Secondary Education Act (ESEA).

My fellow chief state school officers and I support coordination on STEM education among states and national organizations since we learn from sharing our experiences and ideas and

adopting successful practices from other states. In fact, recommendations from our Math and Science Education Task Force emphasize working with national organizations to enhance curricula, instructional materials, and the STEM education movement more broadly. We also believe that a state has the responsibility to align P-16 expectations, curriculum, and licensing requirements to ensure that the state systems are aligned, to not only create the most powerful opportunities for students but also to ensure smooth transitions of students. States across this nation are already engaged in this work.

The national STEM education council seeks to increase collaboration and coordination among stakeholders; however, the council runs the risk of creating another level of bureaucracy rather than moving the conversation on STEM education forward. States are already taking many steps on their own to build our students' knowledge of science, technology, engineering, and math and align high school with college and work expectations. These efforts should receive support from the federal government so promising work can be expanded. Funding that assists a state to implement innovative models and actions to engage students' minds and their willingness to pursue math and science careers is much more helpful than more bureaucratic processes or directions. Iowa's high school reform efforts are focusing on creating teaching approaches that develop authentic intellectual work on the part of the students and teaching strategies that engage students in relevant and meaningful tasks and high level skills.

There are other specific concerns I have with the STEM education council. The council's charge to develop STEM content guidelines may easily be perceived as creation of national content standards. Since a large number of states and localities are not involved in the decision-making process, the council will not have as much buy-in for this initiative. The council may not be an appropriate vehicle for creation of national STEM content standards. Instead of national content standards, the council could develop crosscutting, integrative areas that move the discussion to what is the intent of STEM education. We must imbed the mathematics, science, and technology skills required of world class students across the disciplines and within the career and technical courses. Also, one of the responsibilities of the council is to create a regular report on STEM education in states and the nation. This may not be the best use of time and funds for the council

since there is no clear value in producing another report unless it truly helps states and districts improve their policies.

Changes to STEM education cannot be considered without acknowledging the current accountability environment states and districts encounter under NCLB, which can provide a disincentive to deep, meaningful change in STEM education. Also, as the NSB action plan acknowledges, assessments must match state standards to have a significant impact. If state standards require students to demonstrate problem-solving skills and apply their knowledge to real world situations, then assessments must do the same. Funding and support from the federal government to create better assessments has not been adequately provided in the past. The report recognizes the importance of assessment and that states should enhance their math and science assessment systems. However, the action plan does not address how states would deal with the cost and amount of time it takes to produce these more complex assessments. I believe that the federal government could play a role in supporting states' development of assessments that require high-level thinking and are also designed to provide feedback to teachers that they can use to improve instruction. Iowa is fortunate to have several companies that are "experts in assessment" in our backyard. But, the types of assessments being discussed are expensive. States simply do not have the resources currently to develop assessments that measure what is truly meaningful to measure. At the same time we must consider where limited funds can best be spent. I would prefer investing in improving the quality of teaching.

This takes me to another topic with great focus in the report: professional development. It is a key way that we can improve STEM education since we must change what occurs in our classrooms if we want to see changes in student learning. To build on the action plan's recommendations around professional development, there should be greater emphasis on communicating to education leaders and teachers what quality really means in professional development and the knowledge and skills STEM teachers need to be effective. On-going, in-depth, on the job professional development will hold the greatest promise of improving teaching and learning. Pre-service programs must also incorporate STEM learning for elementary school classroom teachers, who are often young children's primary science educators. The action plan

should acknowledge the need for prospective elementary school teachers to receive challenging math and science content and pedagogy or coursework in their teacher preparation programs.

Overall, I am pleased to see that the National Science Board's action plan for STEM education recognizes the leadership of states and districts on STEM education issues and seeks to enhance collaboration and communication between all STEM stakeholders. The federal government should play a role in improving STEM education by increasing coordination among federal agencies and programs and supporting and communicating more STEM education research that is useful to educators and policymakers. The federal government needs to provide assistance to states and districts to develop and expand innovative programs on STEM education. We look forward to continuing our dialogue with you about ways to improve student learning in science, technology, engineering, and math education.

Thank you. I look forward to any questions you may have.