EDUCATION

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WORKSHOP HIGHLIGHTS

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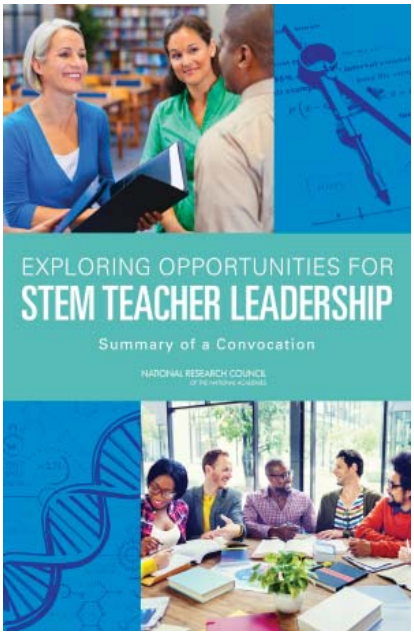
Exploring Opportunities for STEM Teacher Leadership



Many national initiatives in K-12 science, technology, engineering, and mathematics (STEM) education have emphasized the role of teachers in improving student learning and sought ways to enhance teachers' preparation, professional development, and evaluation. Yet one critical set of voices has been largely missing from the discussion—that of classroom teachers themselves. A number of studies has shown that when teachers are effectively engaged in policy and decision making, teacher morale improves, retention may increase, and the school and surrounding communities benefit.

To explore the potential for STEM teacher leaders to improve student learning through involvement in education policy and decision making, the National Research Council held a convocation in June 2014 in Washington, D.C. that brought together representatives from public and private organizations, along with many teachers who have held leadership positions.

OPPORTUNITIES AND CHALLENGES FOR TEACHER LEADERSHIP

During an introductory plenary session, **Bruce Alberts** of the University of California, San Francisco, observed that the changes required to implement the Next Generation Science Standards require extensive involvement by teachers. One of the challenges in engaging teachers as leaders, however, is that schools remain predominately hierarchical organizations; even as businesses have learned to harvest "ground truth" from their employees to improve systems, many schools still remain relentlessly top-down. Alberts also emphasized the need for funding organizations to support projects that replicate and adapt what works, rather than always focusing on innovation. "If all we have is innovation and no spreading of what works, then we won't make much progress."

Barnett Berry of the Center for Teaching Quality in North Carolina noted that many members of the public have a difficult time thinking that teachers are working in the best interest of students when they are not in front of a classroom. But the top-performers in international comparisons of STEM student achievement—such as Finland, Japan, Shanghai, and Singapore—invest heavily in teachers and teacher leadership, which often takes them out of the classroom, he said. Professional development systems in these countries provide opportunities to get beyond "what" to teach to "how and why." Polls show that about half of U.S. teachers are interested in hybrid roles that involve both teaching and leading.

As **Suzanne Wilson** of the University of Connecticut observed, research indicates that most teacher learning does not happen in formal professional development but in a variety of other contexts, such as preparation for National Board certification, curriculum or assessment development, interaction with school leadership, and everyday experiences in the classroom. From her analysis of such research, Wilson concluded that the work of teaching needs to be systematically enhanced so that people can learn from it; rather than being accidental and serendipitous, teacher learning can be more planned and deliberate. She also noted that teacher leadership can have different goals; leaders can formulate policy, which requires particular skills and knowledge; they can develop expertise, which can then be disseminated; or they can help disseminate expertise developed by others, which requires a different skill set.

Suzanne Donovan of the Strategic Education Research Partnership (SERP) stressed the need to improve education by focusing on what is happening in classrooms, rather than viewing incentives and accountability as the primary drivers of educational change. SERP enables teachers and administrators to play a central role in designing tools, programs, and practices that can result in achievement gains, she explained. The organization's process involves proposing and designing solutions, testing them in practice settings, finding out whether they work or not, and making iterative revisions until something does work. One of the most popular products designed through this process is a collection of five-by-eight-inch cards that list the principles a lesson is designed to achieve and the vital actions expected of students. The idea was to give teachers something they can use to figure out why they need to change. This approach treats teachers differently, as essential members of a team and as clients for whom the design team needs to design. Classrooms taught using this approach can look more chaotic than normal classrooms, but they can also increase student learning, said Donovan.

MODELS FOR ENGAGING TEACHERS' VOICES

Various programs exist for involving teacher leaders in education policy and decision making, and six were examined in detail by participants at the convocation as models for a substantial expansion of teacher leadership.

- **Albert Einstein Distinguished Educator Fellowships** allow accomplished K-12 STEM educators to spend 11 months working in a federal agency or U.S. congressional office, bringing their knowledge and classroom experience to education program or policy efforts.
- **Knowles Science Teaching Foundation Fellowships** are designed to improve STEM education by building a network of teachers who are also leaders in the classroom. The program includes both a five-year fellowship program for beginning high school STEM teachers and a senior fellows program that sustains teachers as leaders over the long term.
- **Math for America** recruits, trains, and retains talented mathematics teachers in secondary schools over the course of a five-year fellowship. A second program supports master teachers who can become leaders within and beyond their schools.
- **Presidential Awards for Excellence in Mathematics and Science Teaching** is organized through the National Science Foundation and recognizes 108 awardees annually—two from each state and from four jurisdictions—for excellent mathematics and science teaching. When they return to their schools, the teachers serve on committees, help with curriculum change, and participate in endeavors from the school level to the state level.
- **The National Academies Teacher Advisory Council** was established to provide teachers with a recognized voice in education policy making. The Council's membership represents all levels of K-12 education and a variety of disciplines.
- **The Fulbright Distinguished Awards in Teaching Program** funds U.S. educators to go abroad for three to six months, typically to study pedagogy and education systems and to observe classes. In addition, teachers from other countries are funded to come to the United States.

"We see this convocation not as a culminating experience but as the beginning of a process to think about how educators, whether formal, informal, or afterschool, can have their voices heard."

Jay Labov,
National Research Council

Additional presentations and discussions at the convocation explored how professional development opportunities could support teachers in moving toward leadership roles, the role of administrators in empowering teachers, and avenues for moving education research about teacher leadership into classroom practice.

The proceedings of the workshop are discussed more fully in *Exploring Opportunities for STEM Teacher Leadership: Summary of a Convocation* (Steve Olson and Jay Labov, Rapporteurs), available from National Academies Press; (800) 624-6242; http://www.nap.edu.

For more information...This workshop highlights brief was prepared by the Teacher Advisory Council based on the workshop and summary. The project was supported by a grant from the National Science Foundation. Any opinions, findings, conclusions, or recommendations expressed in the summary or in this brief reflect those of individual workshop participants and do not represent the views of all participants, the sponsor, or the National Research Council.