A New Equation

How Encore Careers in Math and Science Education Equal More Success for Students

By Elizabeth Foster
National Commission on Teaching and America's Future
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ENCORE CAREERS

Introduction: A National Challenge

The global economy increasingly calls for specialists in science, technology, engineering and math, as well as citizens who are aware and informed about scientific concepts. From local schools embracing hands-on, inquiry-based approaches to learning science, technology, engineering and mathematics (STEM) to President Obama calling for hundreds of thousands of scientists and engineers to join teachers in improving STEM education, there is a bright spotlight right now on improving student achievement and success in these fields. We can make the most of the opportunities in local schools and at the national level by engaging professionals with real-world expertise in new and innovative roles.

A 2007 *Jobs for the Future* report suggests that current teaching methods fail to prepare three-quarters of today's students for college studies in science, technology, engineering and mathematics.[1] And employers, often left to remediate gaps in knowledge and skills, say that graduates can't apply their science education in a STEM work environment and lack the ability to work the way scientists do – in teams, solving problems and thinking innovatively. A National Association of Manufacturers survey found that 51 percent of employers say recent graduates are "deficient" in math and science.[2]

Boomers seeking encore careers want to continue to work and use their skills to benefit society.

To address this problem where it begins – in the classroom – many STEM industry leaders offer workshops, sponsor partnerships and provide resources to public schools. Some leaders work with students directly, as in Lockheed Martin's Information Technology Apprenticeship Program, which helps under-represented high school students develop the talent and skills necessary for meaningful technical careers.[3] Others, such as Sandia National Labs in Albuquerque, N.M., work to support teachers, offering training and internships for outstanding science teachers from the local public schools.[4] Still others are creating programs that transition scientists and engineers into teaching jobs, as in Intel Corp.'s partnership with the Arizona Department of Education, to develop an adjunct teaching program.[5]

These programs have the right idea. They draw participants from a deeply experienced, eager and passionate group of professionals: boomers seeking encore careers. These individuals – many of whom are approaching traditional retirement age – want to continue to work and use their skills to benefit society.

The challenge is figuring out how to best make use of their abilities and willingness to work for the greater good to serve students and, ultimately, elevate the country's future work force.

A Generation Stands Ready

Shifts in the work force (both in education and more broadly) provide an opportunity to apply other creative approaches in our quest for more effective STEM teaching. Increasingly, professionals change careers and explore new and varied professional opportunities, rather than remain in a single track for their entire careers, balancing work and life to create a career "lattice" rather than a career ladder.[6] For instance, the percentage of veteran teachers who identify themselves as both "teaching" and "retired" shows a marked increase in the most recent (2007-08) federal Schools and Staffing Survey results.[7] Schools recognize the value of employing retired teachers but haven't undertaken the policy changes that would make extended flexible career options an enticing alternative to retirement.

Boomers built the space program, started the environmental movement and sparked the technology age.

In addition, we now have a great opportunity to mobilize STEM professionals from fields outside of education, individuals interested in taking on new roles or even wholly new encore careers after retirement. Such careers allow people to use their skills in new ways to serve society. Boomers seeking encore careers present a unique opportunity. This generation built the space program, started the environmental movement and sparked the technology age. Boomers make up the healthiest and wealthiest generation of retirement-aged folks the country has ever seen – and many of them are staying put during retirement because they are eager to give back to the communities where they have lived and worked.

In 2005, 65 percent of boomers said that work would continue to be a part of their lives post-retirement; and 50 percent of those individuals wanted to combine income with a contribution to the greater good.[8] These results were echoed in a similar survey in 2008.[9] Many individuals are eager to give back to education, help develop the future STEM work force and share their passion for their work.

This paper highlights how boomers with various professional backgrounds can help improve how schools deliver science, technology, engineering and math education. The stories that follow illustrate how three individuals – former teacher Rick Marquart, retired engineer Alan Cleland and former corporate executive Bob Abrams – are making that happen through innovative programs.

CASE STUDY NO. 1

Rick Marquart

From Math Teacher to STEM Learning Studios Coordinator

Rick Marquart has spent his entire career in the Howard County, Md., public schools, but he has done much more than stand in front of a classroom. Through the years, he has embraced varied roles within a school system that values individuals with experience, wisdom and the openness to new opportunities.

Certified in math education, Marquart taught high school mathematics for 15 years, including a stint as the department chair prior to being selected by district leadership to open an innovative high school. The high school was designed around teachers working in small learning communities, a new concept for the district but one that influenced Marquart's career: He became a strong advocate of empowering teachers to work together. Marquart focused on integrating a single subject – math – into learning community projects and on strengthening students' understanding of math. At age 54 and after teaching for 30 years, Marquart retired.

Retirement lasted about a month. When Howard County schools received a grant from the Maryland department of education to support innovative STEM initiatives in the county, the district tapped Marquart to manage the project. Given the relationships he developed over decades in the county school system and his diverse experience, it was a natural fit: "I know everyone, and I know how it all works," he says. Marquart now works approximately 20 hours a week as a consultant, paid an hourly wage with his health care paid for as part of his retirement benefits. One of the projects he directs is the NASA 21st Century Learning Studios, funded by NASA under the leadership of the National Commission on Teaching and America's Future. (See sidebar.)

NCTAF and NASA Create New Opportunities Through Learning Studios

The National Commission on Teaching and America's Future (NCTAF) has developed STEM Learning Studios across the country that bring together STEM teachers with scientists and engineers in collaborative, project-based design teams to address challenging student learning gaps. In Maryland's NASA 21st Century Learning Studios project, interdisciplinary teams of high school teachers in two school districts are working together to create content in math, science and technology that involves NASA content, tools and experts. Last spring, Fred Espenak, or "Mr. Eclipse" as he likes to be called – a retired NASA Goddard Space Flight Center scientist who is a top expert on lunar and solar eclipses – helped teachers create projects to engage their students using up-to-the minute data on eclipses. Other experts, such as "NASA Mike" Comberiate, an engineer and systems manager at NASA Goddard, in Greenbelt, Md., are approaching retirement and are eager to find ways to continue sharing their knowledge and passion with teachers and students.

Through the STEM Learning Studios, several NASA Goddard scientists and engineers have worked with local high school teachers to increase student engagement in the curriculum materials. By working closely with teachers to identify what they need (a tour of a robotics lab or presentation on global climate change), the NASA professionals become important parts of their teams. These engagements differ from the traditional drop-in workshops or guest speaker appearances; the NASA Goddard scientists – current and retired – brainstorm alongside teachers about the best ways to engage students in the research and data. Together teachers and scientists then connect NASA missions and tools with the core concepts students need to know in science, math, engineering and technology.

To learn more about the NASA 21st Century Learning Studios and NCTAF, visit **www.nctaf.org**.

Like many retirees today, Marquart found that retirement "isn't what it used to be." He does not want to spend his days solely in pursuit of leisure activities. He says it is important for him to continue to work, contribute to the school system he knows and loves and stay active and engaged. Earning additional income is important, too. This perspective drives him to help the schools use retired or nearly retired professionals in sustained roles to support teachers and students. Howard County recognizes that an experienced professional can often provide decades of expertise and wisdom for the going hourly wage, so the county regularly recruits retired teachers to come back to serve in critical needs areas, such as STEM teaching. It also actively recruits and encourages midcareer professionals to come into STEM teaching. For example, in a NASA 21st Century Learning Studios project, one of the team leaders is a former forensic scientist who now teaches high school science. She reminds her students that, even though careers in science don't look exactly like the television crime drama *CSI*, there is a lot of science involved in exciting careers like those on TV.

Marquart took the initiative to bring in retired science and math teachers as coaches and liaisons between the Learning Studios teams and the NASA education department and scientists. These part-time positions are a win-win. Novice teachers receive support from veterans. Meanwhile, the veteran teachers who have come out of retirement stay engaged and find themselves continually learning as they interact with NASA scientists and engineers.

Marquart has found that formalizing part-time roles and clarifying expectations and timing around how encore professionals work with teachers helps sustain relationships and ensure professionalism and accountability. He works with the teams of teachers to list and prioritize the NASA scientists' expertise and skills that will have the most positive impact on student learning. "The key element to success is structure," says Marquart. "If we can help the retirees feel that they are not just guest speakers, that they are valued and paid professionals, it gives them the sense that they are contributing in a meaningful way."

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- Rick Marquart, coordinator
NASA 21st Century Learning Studios

CASE STUDY NO. 2

Alan Cleland

From Mechanical Engineer to Teaching Apprentice

At a recent high school graduation ceremony in Palo Alto, Calif., Alan Cleland received a rose and a hug from a student he had tutored in math. "You were there for me when I needed you," the student said. That exchange is a big part of what is driving Cleland to pursue a teaching career, his "10th or 12th career" at age 71.

Cleland is an EnCorps teacher candidate – one of hundreds of STEM professionals in California over age 50 who are tutoring to gain classroom experience, in pursuit of a teaching career. (See sidebar.) Cleland, whose former careers include mechanical engineer, U.S. Navy construction engineer, petrochemical plant developer and business strategist, is taking a thoughtful approach to becoming a teacher. He started by attending a summer EnCorps Teachers Program "boot camp" that gave him basic information about teaching, child development and where to find additional resources. He then tried out STEM teaching by becoming a one-to-one tutor for a junior high student through an arrangement made by EnCorps, working three to five hours a week for three months.

Given his positive experience and a desire to learn more, Cleland moved into the role of guest teacher, supporting two classroom teachers for three to five hours a week for 10 weeks – eventually leading up to teaching a full lesson on his own. This progressively increasing involvement helped Cleland "gain a sense of what it really means to be responsible for that classroom's learning."

Cleland's volunteering was monitored and guided by an EnCorps regional program director charged with helping individuals move along a career pathway toward STEM teaching. The next steps are to obtain a teaching intern credential, pass a state-required teaching foundation exam, complete another summer preparation program and start full time as a teacher of record. Through strategic partnerships with the well-established New Teacher Center and Citizen Schools, as well as work with the state and local districts, EnCorps supports candidates as they work in schools. EnCorps' support to teachers-in-training includes a critical friends group of other EnCorps candidates, regular webinars and five classroom observations a year.

EnCorps Teachers Program Engages STEM Professionals

The EnCorps Teachers Program is a public-private partnership designed to increase the number of math and science teachers in California's public middle and high schools. EnCorps was founded in 2008 to move experienced STEM professionals toward STEM tutoring and teaching. Participants include former managers and engineers from major corporations, such as Amgen Inc., IBM Corp., Hewlett Packard Company and Deloitte LLP. Launched with private foundation and state support, EnCorps guides participants from tutoring to assisting in a classroom to pursuing full-time teaching careers. Individuals can choose to stay in any one of those stages if it suits them better than full-time teaching. EnCorps gives individuals a clear sense of the challenges of teaching and the complexities of underserved schools. The program regularly assesses candidates' interest and readiness to progress toward teaching careers.

There are 135 individuals currently active in the program – 87 people in classrooms. EnCorps is currently only in California, but it could replicate in other states given funding and support.

To learn more about the EnCorps Teachers Program, visit **www.encorpsteachers.org**.

In addition, EnCorps' partnership with Alliant International University allows Cleland to complete the required university coursework for certification in one year, rather than the traditional two years. This fast track is attractive to older professionals who are eager to get started. Nonetheless, Cleland's classroom experience made him recognize that he needs a "big bag of tricks" to be a teacher. Although he has a Harvard University MBA and a Yale University engineering degree, he says "there is no substitute for on-the-job learning."

What is especially interesting about the EnCorps process is that the program conducts "fit interviews" periodically throughout the development process so that candidates and EnCorps staff regularly assess whether the candidate is a good fit for urban STEM teaching. According to Jennifer Anastasoff, EnCorps executive director, about 40 percent of those that start with the summer boot camp decide that they don't want to teach – either when they are tutoring or when they are guest teachers in classrooms.

Although Alan Cleland, a teaching apprentice through the EnCorps Teachers Program, has a Harvard University MBA and a Yale University engineering degree, he says "there is no substitute for on-the-job learning."

EnCorps members are regularly assessed to see if they are qualified, coachable and pursuing teaching because they are interested in helping students succeed. The rate of opting out is similar to the attrition rate of new teachers (30 percent to 40 percent in the first three years). However, because EnCorps teachers and teachers-in-training are not the teachers of record, the students in the classroom are still being taught by trained professionals while the apprentices are sampling the profession. If that potential EnCorps teacher is not able to find successful ways to reach those students, or decides teaching is not for him or her, no students will have lost learning time or opportunity. This supported transition opportunity allows potential career-switchers to try out classroom teaching first-hand, while also ensuring that students have access to a highly qualified teacher at all times.

If Cleland is an indicator of the 60 percent of recruits who continued along the pathway to full-time teaching, this approach has real promise. Cleland says that although he started out unsure of himself he is now ready for his own classroom and "eager to teach a course from beginning to end."

CASE STUDY NO. 3

Robert Abrams

From Finance Manager to Education Program Facilitator

At age 61, Robert Abrams has already had multiple careers and life experiences: Peace Corps volunteer; entrepreneur; finance and planning executive at Cummins Inc., a leading engine manufacturer; local school board member; and parent of three children. He is now working in a role that enables him to use his experience and skills to improve student achievement and work force development in math and science, working with teachers and administrators across southeastern Indiana.

While serving four years as an elected school board member, Abrams worked closely with the superintendent on issues related to restructuring and improving management processes. Abrams recognized the opportunity for schools and school districts to utilize the broad business training he had acquired over the years. In 2008, when his company presented an option for early retirement, he welcomed the chance to put his skills to work in the public sector.

Abrams took a full-time position with a coalition called Economic Opportunities through Education by 2015 (EcO15), forging partnerships among industry, the community and the school system to develop hands-on learning activities in math and science. (See sidebar.) "EcO15 is based upon the fundamental belief that it is the collective responsibility of educators and businesses to better prepare our students to prosper," Abrams explains.

Abrams' skills from the corporate world serve him well in nonprofit work. At Cummins, he refined his knowledge of process development – analyzing what is working and what is not, developing long-term strategic plans and breaking down the associated tasks into manageable chunks. "I'm 61 years old so I've had a diversity of experiences. … I have

Economic Opportunities Through Education by 2015 Tapping STEM Workers

In 2008, the Lilly Endowment launched an initiative to improve the education and job preparation of Indiana students through a comprehensive regional investment in a coalition called Economic Opportunities through Education by 2015 (EcO15). The coalition builds and sustains relationships among industry, community and the education system. Ten counties received funding to support business-school liaison/coordinators – one for each county – who build and sustain partnerships to improve STEM education.

The county coordinator role provides an interesting opportunity for a former STEM professional to focus on supporting and improving local STEM education. For example, one coordinator is a retired banker; another is a retired emergency medical technician. While the position is open to individuals of all backgrounds (experienced or new), the strong regional connections; understanding of local politics, history and education trends; and commitment to the community that a local retired professional brings to this role can be very valuable.

Math Matters and Molecules Matter, EcO15 programs, show how the business-school partnerships help teachers improve student achievement in math. Teachers and local businesspeople collaborate to develop projects based on actual business operations and problems. For instance, through Math Matters, students create sales and marketing scenarios for local businesses, using their prealgebra, algebra and geometry skills. The teachers provide the classroom instruction, while EcO15 provides project-based learning instruction, resources and ongoing support for teachers. The hands-on approaches make learning math engaging and help students understand how what they are learning in the classroom can apply to future work and career choices.

The effort has shown such promise that all 10 counties intend to keep the county coordinator positions after the grant funding has ended. This institutional sustainability will allow the programs to continue, develop and have lasting impact.

To learn more about EcO15, visit **www.eco15.org**.

cultivated an ability to deal with different kinds of people and to know when to push and when not to push." This is a skill set that can be lacking among nonprofit and school leaders, who may work well with students but may have no experience managing large organizations.

Plus, Abrams' deep personal knowledge of what STEM employers are looking for in future employees encourages educators to see student achievement in the broad context of preparing future professionals facing highly demanding STEM careers.

Abrams notes that the expectations for accountability and fast deadlines that he developed during his years in business can clash with the way things typically operate in schools, but he thinks the relationships are progressing nicely because everyone is eager to help students excel.

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Engaging Boomers to Inspire Change

Many boomers already make contributions in education through tutoring or other support services in classrooms – services that help students improve academically.[10] But the benefits of those one-to-one relationships could increase exponentially if encore talent and expertise were targeted to support innovative learning programs, such as the projects profiled above. Boomers, including Marquart, Cleland and Abrams, are eager to share their knowledge through a range of experiences – from tutoring and classroom visits to full-time teaching. Structuring and guiding those experiences based on the needs of students and the inclinations of STEM professionals improve the odds for success.

Effective roles that improve how students learn math and science may not conform to traditional school structures. Currently, they may include ad hoc work arrangements that link experienced professionals to specific needs. For instance, instead of becoming a principal after decades as a beloved teacher, Marquart began an encore career to support innovative STEM programs and public-private partnerships that strengthen his district's approach to science teaching and learning. Marquart's work connects what would otherwise be a series of disconnected one-off initiatives. EnCorps is working at the next level of institutionalization, defining the steps and support needed to move experienced professionals toward teaching.

There are a range of roles that experienced STEM professionals can play in helping to improve teaching and learning in the STEM fields. As they approach retirement, many individuals serve as volunteers to get a sense for what they'd like to do next. Some opportunities include:

The benefits of informal, one-to-one relationships could increase exponentially if encore talent and expertise were targeted to support innovative learning programs.

- Hosting internships at a current STEM workplace, to connect with students and teachers and provide students with a firsthand look at a STEM workplace
- Sharing special expertise, career experiences or personal stories of professional achievement with groups of educators through the school board, a public-private partnership or an education foundation
- Sponsoring an apprenticeship or contest that includes students and teachers in real-world challenges, such as collecting data, writing technical papers or developing computer models that can be done in the classroom but used in the workplace
- Coaching teachers-in-training or teachers who are trying to develop new skills (such as integrating technology into the classroom)
- Collaborating on teams with teachers as STEM curriculum developers, project designers and content advisers, providing content expertise, workshops and connections to industry leaders

Why Are New Approaches Necessary?

To support student mastery in STEM disciplines – where knowledge rapidly evolves, learning is a collaborative process and technology constantly changes – STEM teachers must be well prepared, well supported and provided with professional development that keeps them up to date. It's important to note that STEM teachers are leaving the profession at the same rate as teachers of other subjects: 30 percent to 50 percent in the first few years [11] – typically because they feel isolated, unsupported or frustrated by antiquated conditions. Or they feel that textbook-bound curriculum and pacing guides hinder them from teaching science in engaging and collaborative ways that prepare students for STEM college studies and careers.

Making matters worse, certified teachers are often assigned to teach STEM classes outside their fields or particular interests (such as a geologist teaching physics), and vacant STEM teaching positions are frequently filled by individuals with neither certification nor a deep understanding of STEM content.[12] At the same time, the peak of teacher retirements is upon us: More than half of the nation's K-12 public school teachers are boomers approaching retirement.[13] That situation could result in a loss of the experienced professionals, veteran teachers and mentors who could guide and train new teachers and experienced teachers with expertise in other fields.[14]

Robert Abrams is a great example of how corporate experience can directly benefit education. He leverages as many resources as possible to address the challenge of improving STEM education, whether those resources are businesspeople, educators or university professors.

But the good news is that, although school systems may seem monolithic, superintendents and principals have leeway in their staffing strategies. In fact, large numbers of boomers are now assuming positions in policymaking – in schools, districts and at all levels of state and federal education departments – and in community development roles at many STEM industries and federal agencies. These individuals are approaching traditional retirement age and recognizing that they are interested in sharing what they have learned; focusing on a positive aspect of their work that has been overshadowed by other demands; or just finally addressing a desire to give back to their communities in different ways.

Former corporate executive Robert Abrams is a great example of how strategic and management experience can directly benefit education. His business training tells him to leverage as many resources as possible to address the challenge of improving STEM education, whether those resources are businesspeople, educators or university professors.

Some people approaching retirement age "struggle to try to find a way to do what they have always done," Abrams notes. "But there is an array of ways they can use

the skills they have developed over the years. And it is much more satisfying to work in this type of role."

Tapping into this desire and capacity wherever it exists will help open up more creative, flexible, rewarding work arrangements for experienced professionals who have a lot to contribute to improving STEM education.

Challenges to Making Change

At the same time, public schools present many challenges to developing encore careers. Most education system policies are designed to accommodate an outdated model of a teaching career – one in which a teacher goes directly from a traditional teacher preparation program at age 21 or 22 and stays in that teaching career for 35 years until retirement. Recruitment and hiring practices, salary schedules and retirement plans are all geared toward that traditional career ladder. If and when STEM professionals are invited into schools, they are given limited roles such as presenting workshops, judging science fairs or providing one-hour "career day" glimpses into the workplace. The country's current economic recession has limited those opportunities even more. As many activities and projects have been cut back, teachers are fearful about innovations that might put their jobs at risk. Meanwhile, many local industries are laying off scientists, engineers and technology experts.

In addition to being relatively rare, arrangements for individuals who are "retired" (and therefore collecting benefits) but continue working have serious financial and staffing implications. Individuals who collect pension income plus salaries are costly to the public systems and to taxpayers, but schools often ignore these costs because the experienced individual meets their needs in the best way. Individuals coming to education from other fields are often unfamiliar with teaching itself and with the requirements and structures found in a school environment. The options for trying out teaching may not be clear to an individual operating independently, without the organization that a program such as EnCorps provides in California.

A new structure that provides flexibility, pay and meaningful work could improve STEM teaching, raise student achievement and cut costs.

A new structure that provides flexibility, pay and meaningful work could improve STEM teaching, raise student achievement and cut costs. Nevertheless, the creation of new work arrangements requires stakeholders to focus deliberately on the innovations. The NASA 21st Century Learning Studios partners in Howard County, Md., are working together to define the specifics of team opportunities and responsibilities for NASA Goddard professionals approaching retirement. Making the right match of encore experience and skills to the defined teaching and learning needs is critical. An outstanding astrophysicist who cannot communicate with students or is unwilling to work with the science teacher contributes very little to closing the student achievement gap.

Finally, attention to local context is important to the success of any new encore role. The EcO15 program is based on this reality, as student work benefits local businesses. Experienced professionals can also offer valuable guidance on college applications or on work immediately after high school. In either case, encore professionals can provide insight into the next steps in STEM education or STEM careers – especially valuable to teachers tasked with preparing students for those next steps.

Recommendations

Encore professionals present a powerful untapped resource for American education. But there are a number of factors that need to be put into place to attract more people to math and science encore careers and to make it easier for schools to use the professionals' expertise effectively.

Improving STEM learning is critical for the nation's future work force and an informed citizenry.

- **Public and private funders need to re-examine how they distribute funding.** For instance, funders could offer more support for boomers' work training. They could also make placement programs available to help boomers transition into teaching; such programs could take into account relevant work and life experiences.
- **States and districts should develop certifications for part-time content experts** who could work closely with schools. Creating a system of requirements and simplifying the hiring and assessment processes are key to capitalizing on the boomers' desire for flexible, meaningful work.
- **Federal, state and local funding, as well as private sector support, should be redirected** to help develop work arrangements that engage STEM professionals in meaningful, ongoing and accountable roles in partnership with teachers. Foundations and corporate sponsors also have an opportunity to use their funds creatively. Lessons from models such as those described above can provide valuable guidance and benchmarks.
- **State retirement systems and private STEM industries can inform each other about changes to certification, professional development and retirement rules and regulations** that must be made so that schools and districts can recruit, train and retain people in encore careers without the individuals incurring retirement income penalties.

Conclusion

STEM teaching creates an environment that is ideal for creative work arrangements for experienced professionals. Tools and strategies such as modeling, computer-animated design and project-based learning provide clear roles for STEM professionals to bring in real-world project lessons and to model the inquiry, collaboration, teamwork and creativity that are at the heart of STEM work. Furthermore, STEM learning is critical for the nation's future work force and an informed citizenry. President Obama – whose Educate to Innovate initiative

promotes improving STEM education – said it well, noting that learning science and math "… goes beyond the facts in a biology textbook or the questions on an algebra quiz. It's about the ability to understand our world."

Today we have a great opportunity for education and private industry leaders alike to rethink the organization of schools and create a sustainable, effective deployment of thousands of committed boomers in support of improved STEM education. Will we meet this challenge?

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[2] Partnership for 21st Century Skills. (March 2006). *Results that Matter: 21st Century Skills and High School Reform*. www.p21.org/documents/RTM2006.pdf

[3] See more about Lockheed Martin's Information Technology Apprenticeship Program at www.lockheedmartin.com/isgs/commrel/itap.html.

[4] See more about Sandia National Laboratories' work to strengthem STEM teaching at www.sandia.gov/about/community/education.

[5] See more about the Arizona Teacher Adjunct Initiative at www.intel.com/Assets/PDF/Article/community-AZ-ed.pdf.

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[7] See more about the U.S. Department of Education, National Center for Education Statistics' Schools and Staffing Survey at nces.ed.gov/surveys/sass.

[8] MetLife Foundation and Civic Ventures. (2005). *New Face of Work Survey*. www.encore.org/find/resources/new-face-work-survey

[9] MetLife Foundation and Civic Ventures. (2008). *Encore Career Survey*. www.encore.org/news/encore-career-survey-enc

[10] See, for example, links to research on Experience Corps' impact on student achievement at www.experiencecorps.org/publications/research.cfm. Experience Corps is one of the largest AmeriCorps programs for people 55 and older.

[11] Ingersoll, Richard. (Sept. 2003). *Out-of-Field Teaching and the Limits of Teacher Policy*. Center for the Study of Teaching Policy, University of Washington. depts.washington.edu/ctpmail/PDFs/LimitsPolicy-RI-09-2003.pdf; and
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[13] U.S. Department of Education, National Center for Education Statistics. (2007). *Schools and Staffing Survey, Public and Private School Teacher Data Files 1993–94, 1999–2000, and 2003–04.* nces.ed.gov/surveys/sass

[14] Carroll, Thomas and Foster, Elizabeth. (2010). *Who Will Teach? Experience Matters.* National Commission on Teaching & America's Future. www.nctaf.org/NCTAFWhoWillTeach.pdf.pdf; and
See U.S. Department of Education, above.

NATIONAL COMMISSION ON Teaching and America's Future

Author *Elizabeth Foster* is Director of Strategic Initiatives at the National Commission on Teaching and America's Future (NCTAF). NCTAF is a nonprofit, nonpartisan advocacy and action organization dedicated to providing every child with quality teaching in schools organized for success. With a network of 27 state coalitions, strong school district partnerships and links to professional education organizations across the country, NCTAF provides leadership for innovation and improvement in teaching and learning in America's schools.

nctaf.org

ENCORE CAREERS

Civic Ventures is a national think tank on boomers, work and social purpose. Its Encore Careers campaign aims to engage millions of boomers in encore careers, providing personal fulfillment doing paid work and producing a windfall of talent to solve society's greatest problems.

Encore.org

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