A Program Explores New Roles for Mature Adults in Public School Classrooms

Overview

Across the nation public school districts lack sufficient numbers of qualified math and science teachers. Meanwhile, millions of mature workers approaching retirement are expressing interest in giving back to their communities by working in non-profits, such as schools. The Council for Adult and Experiential Learning (CAEL), a non-profit leader in lifelong education and workforce development, recognizes that mature adults have not only the desire to help their communities and schools, but the time, passion, experience and knowledge to also do so. After careful research and planning, CAEL sought to match this supply of motivated baby boomers with the urgent need to improve science and math education in public schools by creating a volunteer math and science mentoring program that relies on the contributions of mature adults.

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The Mentors 4 STEM program, which has been piloted in Philadelphia and southern New Jersey public high schools, engages and prepares volunteers age 55 and over with professional backgrounds in science, technology, engineering or mathematics (STEM) to collaborate with math and science teachers and work with their students. This program also explores the potential development of new roles within public schools that could be filled by talented older adults.

Due to the limitations of the grant funding for the pilot, the mentor's role was unpaid; however, it is CAEL's intention that this STEM program model will someday provide paid or stipend-supported positions for participants who need continued incomes, especially during this difficult economic time. While there are many older adults who would like to help their schools, there is limited availability of paid classrooms positions that do not require certification. With Mentors 4 STEM, CAEL has tried to demonstrate the value of alternative educational roles in the K-12 education setting that can be filled by qualified individuals who work along side and complement the work of certified teachers.

Research on Concurrent Trends

Today, many older Americans would like to continue working and are no longer content or able to fill their retirement years with leisure and volunteer activities. The MetLife Foundation and Civic Ventures' *New Faces of Work Survey* found that 76% of individuals age 50 to 70 intend to keep working and earning in retirement.[i] Many in this age bracket want to engage in work of social value and find new ways to use the knowledge they have gained from their vocation or avocation in different but useful ways. Of those who want to continue working past retirement, many would like their second, or "encore," career to provide social and mental stimulation and a sense of purpose that come from transitioning to meaningful work contributing to the common good. The *New Faces of Work Survey* also revealed that education seems to satisfy these criteria. Of those who want to work in retirement, 55% are interested in tutoring or other educational positions, and 21% have previously volunteered in a tutoring or educational program.[ii]

While mature adults express interest in "giving back" to their communities, especially in the area of education, public school districts nationwide are struggling to address the shortage of qualified math, science, and technology teachers, especially in disadvantaged urban areas. According to a 2007 study by the National Commission on Teaching and America's Future, the turnover rate among teachers in the United States is 16.8% and 20% in urban areas, causing school districts to incur substantial costs to recruit and retain new teachers.[iii] Furthermore, the Business-Higher Education Forum estimates that by 2015 schools across the country will need over 250,000 math and science teachers, and that schools serving economically-disadvantaged students - namely urban and rural schools - will be affected most by these shortages.[iv] Even when districts find individuals to fill vacancies, the candidates often lack a strong background in science or math. As cited in the Congressional Research Service report on STEM education prepared for Congress, many math and science middle school and high school teachers lack a degree in the subject they are teaching despite the evidence that students perform better in math and science with teachers who have corresponding undergraduate majors.[v]

The Origins of Mentors 4 STEM

After monitoring these concurrent workforce and education trends over the past few years, CAEL sought to apply its experience as an intermediary organization to design a program model that would recruit and train qualified retired and semi-retired adults to improve STEM teaching in urban school districts in a role other than that of a certified teacher. With a planning grant from the Ewing Marion Kauffman Foundation, CAEL assembled an advisory board of leaders and experts in educational administration, policy, and research, as well as mature worker issues. These stakeholders discussed the needs and challenges of urban public schools and explored the value of a range of roles, from teacher to mentor to aide, which older adults could fill to improve STEM achievement among low-income students.

Overview of the Mentors 4 STEM Program

Philadelphia Pilot	New Jersey Pilot
Duration: September 2009 – March 2010 **Site:** 2 charter high schools • Grade 9-12 • 150 students • 11 teachers • 99% minority • Grades 9-12 • 200 students • 12 teachers • Majority minority **Mentors:** 5 mentors • Gender breakdown: 2 women, 3 men • Average age: 66 years old • STEM fields represented: information technology, healthcare, pharmaceutical sciences, civil engineering	**Duration:** February 2010 – May 2010 **Site:** 1 public high school • Grades 9-12 • 1,700 students • 100 teachers • 80% minority **Mentors:** 6 mentors • Gender breakdown: 6 men • Average age: 60 years old • STEM fields represented: information technology, healthcare, electrical engineering, science education, mechanical engineering

With the insight and guidance provided by the board and funding from a tri-state Workforce Innovation in Regional Economic Development (WIRED) life sciences initiative, CAEL was able to develop a pilot volunteer mentoring program to prepare retirees with STEM backgrounds to assist teachers in urban school districts. Over the course of the 2009-10 school year, eleven former STEM professionals, whose average age was 63, signed up to volunteer in one of three high schools in Philadelphia and southern New Jersey for five or more hours per week. This

group of STEM professionals included former healthcare workers, engineers, computer scientists, and employees of a large pharmaceutical company. Though CAEL's original intention was to create a program that provided a small stipend to its participants, the program relied instead on volunteers because the grant funding could not support paid work.

Development of the Pilot

The Mentors 4 STEM program required the receptivity and buy-in of the participating schools. To identify and engage urban school districts that have demonstrated openness to innovation, CAEL enlisted the help of organizations with many years of experience in K-12 education - Temple University's Experience Corps, a program that engages people 55 and over to mentor and tutor elementary school students, and The Math Forum @ Drexel, an online math education resource center. In Philadelphia, the first pilot site, CAEL and its partners chose two charter high schools since those schools were bound by fewer restrictions than traditional public schools and thus could more easily accommodate the program. The second pilot site was a public high school in southern New Jersey that was recommended to CAEL. When approached, the school district's science supervisor recognized the merits of Mentors 4 STEM and petitioned the School Board for its inclusion.

To build a corps of qualified mentors, CAEL relied on a variety of grassroots recruitment strategies, including word-of-mouth, information sessions, outreach to community centers and places of worships, and posting on free sites like VolunteerMatch and craigslist. The mentors were carefully selected based on interviews and a five-page application. In the Philadelphia pilot, volunteers were also required to submit criminal and child abuse background checks because of school district regulations. The selection process emphasized a strong professional and educational STEM background, prior volunteer work, and an interest in K-12 education. After selecting the mentors, CAEL, together with Experience Works and The Math Forum @ Drexel, delivered a full-day experiential group training to prepare the volunteers for the school environment well as review adolescent learning styles and effective tutoring and teaching methods. Upon completion of the group training, mentors were matched with one to two teachers based on subject matter. Mentors 4 STEM staff then walked the mentors and their teachers through the scheduling process and helped organize classroom observation days for the mentors at the school. Throughout the program, the Mentors 4 STEM staff provided ongoing support to mentors through online correspondence, monthly mentor meetings, and in-class observation.

"Research shows that mentoring and collegial support helps new teachers stay in the profession longer and helps them develop effective teaching skills faster and earlier."

- How Boomers Can Contribute to Student Success

The Role of the Mentor

In the classroom, the mentors were charged with a three-fold mission: share the knowledge they have gained in their professions, demonstrate the real world applications of math and science, and raise awareness of STEM-related careers. Based on collaboration with their teacher, the mentors in the pilot addressed these three overarching goals in a variety of ways. In the first year of the program, the mentors' contributions covered all six of the "encore job categories" outlined in

the Civic Venture's *How Boomers Can Contribute to Student Success* report: adjunct teachers, teaching coaches, content advisors, project coordinators, tutors, and "other roles," such as consultants.[vi] For instance, one of the mentors took on the project coordinator by organizing a field trip to reinforce anatomy lessons in a fun but educational way. After a few months of working with students on human anatomy in her teacher's health and biology classes, the mentor, a former surgeon, took a group of deserving students to the Body Works 2 and the Brain exhibit at the local science center.

Mentors 4 STEM volunteers drew from their own professional experience and training to provide content knowledge and help their teacher-partners prepare experiential activities that would engage students in STEM subjects. Some mentors gave presentations about their careers and helped teachers explain specific scientific concepts with real world examples, while other mentors created lab experiments with their own supplies or worked with small groups of students who were struggling with math. Mentors even lent their expertise to help with the operation of the school. For instance, a former IT architect offered to help his school, which relied on computer-based curriculum, to increase its server capacity and draft a comprehensive IT policy.

"As a new teacher, I need all the help I can get. Also, I believe the students benefit from having a different point of view in the classroom. I also benefit from the experience and knowledge of the mentors."

- Mentors 4 STEM mentee and first-year teacher

Apart from their role as content experts, these older adults were collaborators, cheerleaders, and sounding boards for new teachers, who can often feel isolated in traditional classrooms. As the Civic Venture's report notes, "research shows that mentoring and collegial support helps new teachers stay in the profession longer and helps them develop effective teaching skills faster and earlier."[vii] This extra support provided by the mentors could help teachers cope with the growing pains during first few precarious years of teaching when many in their profession are lost to burnout.[viii]

Lessons Learned from Pilot

CAEL and its partners learned from the first Philadelphia pilot, and helped to make improvements during the second pilot in southern New Jersey. The Mentors 4 STEM staff learned the importance providing substantial lead-time between the school's sign-off and the program roll-out. Since funding for the Philadelphia pilot did not became available until midsummer, a couple months prior the start of the school year, CAEL and its partners did not have much time to plan with school staff and administration. This accelerated program startup meant that in the Philadelphia pilot the program was introduced to the teachers the same day they met their mentors. This compressed timeframe did not allow teachers to plan for the mentors' attendance or carefully consider the ways in which these STEM experts could be best utilized in the classroom.

In planning the second pilot in New Jersey, enough time was allotted to thoroughly present the program and its mission to teachers and school administration as well as explain the mentors' potential roles, citing concrete examples from the Philadelphia pilot. Prior to the program's start, CAEL and its partners were also able to observe math and science courses and meet with several teachers to gauge their interest in working with a mentor. Unlike the Philadelphia site, the New Jersey teachers were given the choice of participating in the Mentors 4 STEM program rather than be assigned by the school administration to work with a mentor. To ensure an effective and appropriate match, New Jersey mentors and teachers took part in a structured matching process, which can be likened to that of a speed-dating event. Mentors talked briefly with each one of the teachers and explained their background while teachers shared information about their classes and learning objectives. Final matches were facilitated by the district's science supervisor and an Experience Corps staff member, who is a former middle school principal.

Another challenge that surfaced during the Philadelphia pilot was the communication gaps that would often arise between the mentor and their teacher over the course of the program. The Philadelphia mentors reported that their teachers would often forget to share their lesson plans, and that they were not always informed of test days or a teacher's absence. In the second pilot in southern New Jersey, CAEL and its partners built in ways to promote better teacher-mentor communication. During the second mentor training, a conscious effort was made to temper mentors' expectations of their teachers. CAEL and its partners emphasized that though teachers have access to computers and other technology in their classrooms, email is not a vital work tool like it is for many other professionals. The Mentors 4 STEM team also encouraged teachers to share their lessons plans as early as possible and to inform their mentors in a timely manner of absences and test days.

The Math Forum @ Drexel customized a Blackboard Vista site for the Mentors 4 STEM program to which both teachers and mentors both had access. On this Blackboard Vista site, users could update a common calendar, post documents such as lesson plans or mentor-developed presentations, participate in message boards, and share helpful web sites. Despite all these efforts, CAEL found that face-to-face meetings at the school were often the most effective mode of communication. It was also helpful, and more appropriate, to have someone within the school administration encourage or remind teachers to contact their mentors. The science supervisor for the district, who worked at the high school several days a week, was a champion of the Mentors 4 STEM program. It was largely his intervention that helped the lines of communication between the mentors and teachers run smoothly.

Impact of the Program

Though the Mentors 4 STEM pilot was small in scope – three high schools and eleven mentors - most of the teachers welcomed it and felt that it had a significant impact on their instruction and on student achievement. A teacher from one of the high schools summed up the program's success with the following:

> "The mentors have certainly been an amazing resource and kids and I have both benefited from their participation in class. They have been a real asset to the students by providing real world experience, inspiration, and expertise that may not have been available without their generosity. [...] The students really enjoy 'asking an expert' about topics that would normally only exist in a textbook or not extend

beyond a classroom setting. [...] Their excitement was reflected by the highest test scores on the chapter tests dealing with anatomy."

Teachers and mentors came to truly appreciate one another's work. One New Jersey mentor, who had expressed admiration for the teacher with whom he worked, is now considering a second career in teaching science after his experiences in the classroom. New teachers voiced their appreciation for having another adult in the classroom, especially one with life experience and STEM knowledge. Mentors were able to enrich math and science instruction with examples from their prior work, such as explaining the role of electric charges in crop dusting, and could help teachers attend to the needs of more students in large urban classrooms. Seasoned teachers too benefitted from this collaboration, as their mentors offered a fresh perspective on topics they had been covering for many years. For example, a mentor matched with a veteran physics teacher was able to create a lab on circuits that replaced an old lab and will be used in the years to come. In appreciation for their contributions, the mentors have been invited by their schools' administration to return next year, and several mentors have already expressed their intention to do so.

Other Ways Older Adults Give Back

Over the past three decades, CAEL has focused on reducing the barriers to education for all adults. In recent years, CAEL has begun to leverage its expertise in lifelong learning and its relationships with higher education and business to facilitate the transition of mature adults from the workforce into "encore" careers with a social purpose. Below are some examples of CAEL's work to expand flexible, meaningful work opportunities for older individuals in this country:

- In 2010, CAEL partnered with the United Way of Southeastern Pennsylvania and Coming of Age - an initiative promoting age 50+ civic engagement, learning and leadership - to design and implement the Encore Volunteer Manager project. This pilot project has trained and placed 15 older adults in yearlong stipend-supported positions that aim to maximize volunteer engagement at select non-profit organizations.
- Beginning in 2009, CAEL has provided technical assistance to the ten regions in Louisiana, Indiana, Maine, Maryland, Michigan, Pennsylvania, Texas, Vermont, Washington, and Wisconsin that are part of Tapping Mature Talent initiative. This three-year public-private partnership funded by the U.S. Department of Labor and The Atlantic Philanthropies aims to include lower-income, mature workers in economic development initiatives and to educate policy makers at all levels about the importance of focusing on these populations.
- CAEL was commissioned by Civic Ventures to write the *How Boomers Can Help the Nation Go Green*, released in Mach 2010, which provided case studies of "encore" careers in the green economy that are appropriate for mature adults. Also profiled were several mature workers who recently made the transition to green jobs.
- Building on the *How Boomers Can Help the Nation Go Green* report, CAEL developed a train-the-trainer curriculum for Experience Works, a national organization that serves older lower-income workers. This curriculum will be used to train existing staff to identify green jobs and prepare their participants for these opportunities.

The Future of Mentors 4 STEM

In late 2009 the Obama administration launched "Educate to Innovate" which aims to improve teacher quality and curriculum in STEM subjects and called upon businesses, organizations, and

citizens to bolster the profile of math and science education.[ix] CAEL has responded by engaging older adults in a grassroots effort to help our nation's underserved student populations gain the math and science skills necessary for technical careers and higher education. However, in order for programs like Mentors 4 STEM program to flourish certain policy implications would need to be addressed. There is a need to promote openness among schools to create and support nonprofessional teaching roles, as well as willingness by teachers to work as part of team that includes non-certified professionals.

Though many baby boomers seek "encore" careers with a social purpose, an increasing number of older adults are primarily motivated by financial reasons to work into their retirement years. For this reason, CAEL would like to transform the role of the STEM mentor into a paid part-time or stipend-supported position that offers older adults the opportunity to help effect positive change in their communities' schools. As many cities and states across the country are cutting education budgets, public school districts do not have the funds to recruit, train and pay mentors. Yet, the layoffs and early retirements of teachers resulting from these budget cuts underline the need for the involvement of willing and experienced mature adults in their neighborhood schools. A next step for the Mentors 4 STEM model might be to connect the program to business and educational institutions that could not only support the program financially but recruit STEM mentors from their own retired employee or alumni networks.

The positive reactions of school administration and teachers to the Mentors 4 STEM program indicate that there is openness to having supplementary classroom roles filled by individuals who could assist with instruction but would not require same level of preparation or certification as teachers. Mentors can provide supplemental content knowledge and an extra point of view to help support STEM learning, as well as give students more individualized attention by lending teachers in often overcrowded urban classrooms an extra set of hands and eyes.

If you have questions about the Mentors 4 STEM program, or would like to join CAEL's effort to improve STEM education, please contact Phyllis Snyder at psnyder [at] cael [dot] org.

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[i] MetLife Foundation and Civic Ventures, "New Face of Work Survey," Civic Ventures, June 2005, http://www.civicventures.org/publications/surveys/new_face_of_work/new_face_of_work.pdf.

[ii] *Ibid.*

[iii] "NCTAF Policy Brief Says Teacher Dropouts Cost Nation More Than $7 Billion Annually," National Commission on Teaching and America's Future, June 20, 2007, http://nctaf.org/resources/news/press_releases/CTT.htm.

[iv] "An American Imperative: Transforming the Recruitment, Retention, and Renewal of Our Nation's Mathematics and Science Teaching Workforce," Business-Higher Education Forum, 2007, http://www.bhef.com/solutions/documents/AnAmericanImperative.pdf

[v] Jeffrey J. Kuenzi, "Science, Technology, Engineering, and Mathematics (STEM) Education: Background, Federal Policy, and Legislative Action," Federation of American Scientists, March 21, 2008, http://www.fas.org/sgp/crs/misc/RL33434.pdf.

[vi] Elizabeth Foster, "How Boomers Can Contribute to Student Success," National Commission on Teaching and America's Future, 2010, http://www.nctaf.org/resources/research_and_reports/nctaf_research_reports/documents/ElizabethFoster-HowBoomersCanContribute.pdf

[vii] *Ibid.*

[viii] According to data from the Schools and Staffing Survey from the National Center on Education Statistics, close half of teachers leave the profession within their first five years of teaching. See Gary Barnes, Edward Crowe, and Benjamin Schaefer, "The Cost of Teacher Turnover in Five School Districts:

A Pilot Study," National Commission on Teaching and America's Future, http://www.nctaf.org/resources/demonstration_projects/turnover/documents/CTTFullReportfinal.pdf

[ix]Kenneth Chang, "White House Begins Campaign to Promote Science and Math Education," *New York Times*, November 23, 2009, http://www.nytimes.com/2009/11/24/science/24educ.html?pagewanted=1&sq=stemeducation educate to innovate&st=cse&scp=3&adxnnlx=1283198461-K1/aog/g1/uUC4xkKVeKVA.