Testimony to the Committee on Education and the Workforce

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Intel Corporation respectfully submits this testimony for the record in conjunction with the Committee's hearing on Education and the Workforce. The testimony will focus on three topics

- Programs to train and develop the next generation of Innovators
- Programs to hire the next generation of innovators, and
- Advocacy and programs to support effective and innovative education partnerships

Intel Corporation

Intel Corporation is the world's largest semiconductor chip maker, based on revenue. We develop advanced integrated digital technology, primarily integrated circuits, for industries such as computing and communications.   Our goal is to be the preeminent computing solutions company that powers the worldwide digital economy. We are transforming from a company with a primary focus on the design and manufacture of semiconductor chips for PCs and servers to a computing company that delivers complete solutions in the form of hardware and software platforms and supporting services.

Intel was founded 45 years ago at the dawn of the digital age in Silicon Valley and our corporate headquarters is in Santa Clara, California. Our history is the history of the 20th century technology revolution and is still being written today. As of the end of 2012 Intel employed over 105,000 people worldwide and more than half of them, over 53,000, are here in the US.

At a time when the need for a revival of US manufacturing is a popular refrain, Intel stands as a unique example of a commitment to US manufacturing. Three-fourths of Intel's manufacturing is here in the United States. In the last two years Intel has broken ground on two large manufacturing facilities in Arizona and Oregon to add to the existing network of fabs in Arizona, Oregon, New Mexico and Massachusetts. According to the Progressive Policy Institute, Intel is

the 5th largest capital investor in the United States[1]. In 2012 alone, Intel invested over $8.5B in capital in the United States. A recent study by Price, Waterhouse, Coopers estimates Intel's total impact on US GDP at $408.5B from 2008-2012.

But Intel's investment in the United States is not limited to manufacturing. Over three-fourths of Intel's research and development is also based here at home. Intel has major R&D facilities in Oregon, Arizona, Massachusetts, Texas, Colorado, Washington, California and South Carolina. Intel is an economic engine in our site communities and the fuel for that engine is our highly skilled workforce.

Intel Chandler, where we manufacture our latest products, is one our largest and most complex sites in the world. We invest $450 million in R&D each year with $2.4 billion average economic impact to Arizona. Of the over 11,000 Intel employees in Arizona, almost 800 are PhD's, 2200 have Masters in Science and 770 MBA's. We understand the importance of Higher Education because these are the students we seek as we hire the best and the brightest engineers and scientists to design the technology of the future, conduct our research and run our factories. Intel is an economic engine for the nation and the fuel for that engine is our highly skilled workforce.

We know that a chronic shortage of engineering students threatens America's role as the world's leading innovator and continues to impede our nation's fragile economic recovery. We believe having a vibrant economy sustained by quality education, a skilled workforce, and innovation is key to our Nation's success. Through our education initiatives and investments, Intel is helping communities build local capacity while preparing the next generation of innovators.

Intel's Education Strategy

For more than four decades, Intel has made education the primary focus of our strategic philanthropic activity. We invest more than $100 million annually in programs that promote STEM education, encourage women and girls to seek careers in technology, foster and celebrate innovation and entrepreneurship among the best and brightest young students in the world and help teachers to incorporate best practices in math, science and the effective use of technology in their work.

We work in coalitions with other high-tech companies to encourage the U.S. Congress and state legislatures to support technology access, development and implementation of more rigorous K-12 mathematics and science standards, as well as assessments to support initiatives that develop 21st century skills, such as critical thinking, collaboration and creativity. These are skills they need to be the innovators of tomorrow. We were among the first to call for more rigorous standards and assessments to ensure that US students are competitive with their peers in other countries. We have been advocates for the Common Core State Standards since the initiative was first conceived and we continue to lend our voice as the implementation of the Common Core becomes a reality.

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[1] Dana G. Carew and Michael Mandel, "Investment Heroes: Who's Betting on America's Future," Progressive Policy Institute, Policy Brief, July 11, 2012.

The statistics are well known to all of us. According to the most recent (2011) National Assessment of Educational Progress (NAEP), commonly referred to as "The Nation's Report Card," only 40 percent of U.S. 4th grade students and 35 percent of 8th grade students (note the trend) performed in mathematics at or above the "proficient" level. In the science assessment, only 32 percent of 8th grade students performed at or above the proficient level. Only 26 percent of 12th grader students scored at or above the proficient level in mathematics and only 21 percent did the same in science in 2009.

But the truth is that what really matters in the 21st century is how our children stack-up in comparison with their peers in other countries who will be seeking the same jobs in the commercial market and designing their own nation's military systems. The well-regarded Programme for International Student Assessment (PISA) assesses the performance of 15-year-olds in mathematics and science, from OECD (Organisation for Economic Co-operation and Development) countries and other countries. In 2009, the average scores of U.S. students in both mathematics and science were below the average of all OECD countries and also below some non-OECD countries. Specifically, U.S. students ranked 23rd in science and 31st in mathematics among the OECD member countries and total of 65 participating countries. And in the most fundamental educational skill of all—reading—our nation's children ranked 17th.

What drives and inspires Intel's commitment to education is both our need to secure a highly skilled workforce for every employer and our desire to ensure that this country remains the global leader in innovation and entrepreneurship.

Hiring the Next Generation of Innovators, Makers and Entrepreneurs

Recent College Graduate Hiring and Internship Programs
From 2010 through 2012 Intel hired over 14,500 recent college graduates, from two-year degrees through PhD. students, from 1700 colleges and universities in the United States. Arizona State University (ASU) is the largest college recruiting partner for openings across Intel sites in the US, generating approximately two times more hires than the next largest partner institution. Between 2010 and 2012 Intel hired 836 students from ASU. We also hired 182 from the University of Arizona and Northern Arizona University.

Internship Programs
Intel partners with colleges and universities each year to hire approximately 1000 summer interns. A new Intel internship-like experience that was piloted with Arizona State University and Chandler-Gilbert Community College, The Intel Ultimate Engineering Experience, is also being considered as a model for multi-company collaboration. This six-week, part-time uniquely designed program provided hands-on technical engineering experience through a variety of technical skill development activities, team based project work, competitions, professional skill development, networking and social activities. Training in engineering design and communications was also covered.

Intel's veteran recruiting team has also partnered with several university chapters of the Student Veterans of America (SVA) organization in order to support our goal of hiring STEM veteran and MBA talent. This effort includes both Arizona State University and The University of

Arizona. In hiring manufacturing technician level Intel not only recruits veterans directly from the military, we also partner with several two-year community colleges to recruit for these roles. It should be noted that veterans attaining a two-year degree at a community college receive special consideration during our recruitment process.

Intel also partners with Arizona State University's College of Technology and Innovation (CTI), developing a flexible BS Engineering degree program for some of our Arizona-based employees, whose schedules aren't aligned with a traditional academic calendar. In addition, to support ongoing employee development over 1100 students utilized Intel's tuition assistance program in 2012, over 300 of them in Arizona's public and private community colleges and universities. This represents an annual investment in our employees and a partnership with higher education totaling almost $8 million dollars.

Curriculum Development, Technology Innovation and Galileo Project

At Intel we also work with our higher education partners across the US to ensure students are able to learn about the latest technology advancements and state-of-the-art-tools. Keeping our universities up to date and competitive is not only good for the technology industry but it is good for our local and national competitiveness. Two elements of these partnerships include curriculum development and access to new technology.   For example we partnered with ASU to develop curriculum to better help students understand environmental and high-volume manufacturing issues with our industry. Other curriculum development includes areas of embedded control, parallel computing and cyber security.

To further spur innovation, Intel is providing 50,000 development boards featuring the new Intel® Quark technology to approximately 1,000 universities worldwide. This is our Galileo project and the new development kits and software programming interface make it easier for students, as well as artists, designers and other do-it-yourself enthusiasts – who often don't have technical backgrounds – to create interactive objects or environments. Our technology is enabling a new generation of entrepreneurs and inventors in rapidly growing areas – from the Internet of Things to wearable computing.   We are also partnering with other organizations such as MIT Media Labs and TechShop to develop curriculum and supporting materials for middle school and high school students—truly a pipeline of the next generation of innovators and makers.

Higher Education Competitions

Intel knows that entrepreneurship and innovation are core drivers of sustainable growth nations and in states like Arizona. Intel's entrepreneurship initiatives drive innovation and accelerate economic growth with a focus on computing technology. One of our key programs is the Intel Global Challenge, a collaboration with University of California Berkeley that promotes entrepreneurship and showcases business opportunities that have the greatest potential for a positive impact on society through the deployment of innovative technologies. Regional competitions enable hundreds of students to showcase their ideas and innovations. The winning

entries from these Intel entrepreneurship programs and regional challenges then get to go to Berkeley for the final Intel Global Challenge event.

Engineering Projects in Community Service: Social Innovation and Entrepreneurship

Grants from the Intel Foundation helped Arizona State University (ASU) and the University of Arizona (UofA) significantly increase participation in the Engineering Projects in Community Service (EPICS) programs for both university and high school students. A National Academy of Engineering Award-winning program, EPICS was developed by Purdue University and is a series of service learning classes and hands-on field experiences. Students solve engineering and technology-based problems for nonprofit community agencies, schools, and government entities. One team at ASU is designing low-cost ways to use solar power to prevent brownouts at a girls' school in Bangladesh; another team is working to develop a mobile, nature-oriented video game designed to encourage young girls to be active outdoors.

Intel Labs

Although a number of Intel business groups support education through internships and volunteerism, one business group, Intel Labs, is unique in its programs that support STEM education. The mission of Intel Labs is to fuel Intel's growth by delivering breakthrough technologies that bring the benefits of the ongoing digital revolution to everyone. In order to achieve this mission, Intel labs must work closely with academia to foster innovation and technology breakthroughs as well as to feed the pipeline of researchers needed by Intel and all industries.

One of the programs of Intel Labs is the Intel PhD Fellowship program. The program's goal is to continuously improve Intel's access to hard-to-find PhD talent through funding and actively mentoring top PhD students working in line with Intel's technical areas of interest and emerging technical pipeline needs. The Intel PhD Fellowship Program works with selected university contacts to connect with student candidates that are working on specific areas of research of interest to Intel. The award is based on the academic calendar and is a one-year award. Each PhD Fellow is paired up with an Intel mentor to provide technical coaching and build a relationship between the student and Intel.

Intel Labs also supports the work of the Anita Borg Institute through grants and board service and through grants for its work in promoting technology careers for women. The Anita Borg Institute recently announced that Intel Corporate was its 2013 Top Company for Technical Women award recipient. One of our recent collaborations with the Institute was sponsorship of the 2012 Grace Hooper Celebration and the upcoming 2014 conference to be held here in Phoenix Arizona. This conference is designed to bring the research and career interests of women in computing to the forefront. Presenters are leaders in their respective fields, representing industrial, academic and government communities. Leading researchers present their current work, while special sessions focus on the role of women in today's technology fields, including computer science, information technology, research and engineering.

In 2012, Intel Labs collaborated with the Intel Corporate Affairs Group to embark on a partnership with Maker Faire, a grassroots movement of entrepreneurs, inventors and tinkerers who seek to encourage STEM careers and a culture of innovation. Describes as the "Greatest Show and Tell in Earth," the Maker Faire creates an opportunity for students to experience first-hand the satisfaction and rewards of hands on work in fields such as computer coding and robotics. Unlike the science competitions sponsored by Intel, Maker Faires are not competitions. They are simply a way for young people to learn by doing. Intel chose to invest in the Maker Movement because Intel was built by makers who envisioned a world of possibilities and instilled in our culture a deep rooted connection to innovation. Maker Faire is an opportunity for Intel and our community of makers to engage and share with other innovators who share these values. In 2012 over 1200 elementary school students in the Silicon Valley visited the San Mateo Maker Faire during Intel sponsored Maker Education Day. In 2013 Intel introduced Maker Spaces as a pilot project in some of Intel's Computer Clubhouses in the United States, with strong results; expansions of this successful program are planned for 2014, including sites in Arizona.

Intel's Education Programs: Rewarding, Recognizing and building the Pipeline

Science Competitions
Our science competitions are at the center of our education programs. Our goal in sponsoring the competitions is to identify and celebrate talented young scientists. Through the Intel Science Talent Search and the Intel International Science and Engineering Fair, we reach over 7 million students around the globe. Through reward and recognition of these students, we inspire younger students to follow in their footsteps and communities to invest in high quality science education.

Each year, more than 1,700 seniors attending American high schools conduct original research projects and present their work in the country's oldest, most prestigious pre-college science competition: the Intel Science Talent Search, a program of Society of Science & the Public. Forty of these young innovators are chosen as finalists and invited to participate in a nearly week-long event in Washington, D.C., where they compete for over $1.25 million in awards and scholarships. Intel STS alumni have achieved some of the world's most prestigious honors: Eleven have won MacArthur Foundation "Genius" grants, six have won the National Medal of Science and the National Medal of Technology, and seven have won the Nobel Prize. The event culminates with the Intel STS Gala in March, where the forty finalists are celebrated and the scholarships awarded at a black-tie event. This event represents how Intel believes the students should be recognized by the public, with as much respect, appreciation and praise as our most accomplished athletes.

Eric S. Chen, 17, of San Diego recently won the top award of $100,000 from the Intel Foundation for his research of potential new drugs to treat the flu. His interdisciplinary approach combined computer modeling with structural studies and biological validation, with a focus on drugs that inhibit endonuclease, an enzyme essential for viral propagation. Eric hopes his work will lead to a new class of drugs to control flu outbreaks during a pandemic, allowing time for a vaccine to be developed.

The Intel International Science and Engineering Fair, also a program of Society for Science & the Public, is the world's largest pre-college science fair competition. Each year, approximately 7 million high school students around the globe develop original research projects and present their work at local science fairs with the hope of winning. Those who do win progress to regional, state, and national competitions. Ultimately, the select few, 1,500 promising young innovators, are invited to participate in Intel's ISEF in the US.

At this week-long celebration of science, technology, engineering, and math, students share ideas, showcase cutting-edge research, and compete for awards and scholarships. At Intel ISEF, awards are based on students' abilities to tackle challenging scientific questions, use authentic research practices, and create solutions for the problems of tomorrow.

The 2012 winner of Intel ISEF, Jack Andraka, is from Crownsville, Maryland, where at the age of 15 he surpassed what most adults achieve in a lifetime. His research discovered a way to detect pancreatic cancer at its earliest stages through a simple and low cost test using a slip of paper and a drop of blood. The implications of his research on early detection for a variety of cancers, including lung and ovarian cancers, are substantial. And he is just getting started.

Hermanas-Latinas Designing Their Future

Intel's programs to encourage students to seek careers in STEM fields are not limited to our large science competitions. In each of our sites in the US, Intel invests in local initiatives that support STEM education. Hundreds of young women from Arizona and Oregon junior high and high schools participate in Hermanas conferences. Guided by the mission of increasing the number of under-represented females in science, technology, engineering and mathematics (STEM) fields, the one-day conference provides a supportive environment in which young women can interact with successful Latinas in STEM careers, explore technological careers, receive encouragement to finish school, attend college, and to pursue their goals.

Intel's Latino employee group volunteer at the conferences to provide mentoring for the students. The projects undertaken at the conference ranged from extracting DNA from strawberries to the science behind crime scene investigations. One young woman, quoted in media coverage of the conference, said: "I haven't seen many Hispanic women doing things like that. It inspired me because I feel like we could go far."[2]

Project Lead the Way

Intel has a long history in supporting Project Lead the Way (PLTW) in our site communities, but one of our most successful and deepest relationships have built with PLTW is rooted in the state of California. About six years ago, Intel identified PLTW as a best known method for inspiring students to pursue STEM careers, while providing critical professional development to educators. The program was most effective in helping the teachers become comfortable with delivering instruction using a hands-on, project based course. Using the San Diego region's PLTW implementation template as a model, Intel partnered with Sacramento's economic and

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[2] Andrea Castillo, "Latina high schoolers from Forest Grove, Hillsboro, Beaverton introduced to science, technology careers," The Oregonian, February 23, 2013.

workforce development affiliate of their local chamber of commerce, Next Ed, to scale up PLTW to a multi-county, multi district approach. At the start of the implementation, PLTW was in two schools in the greater Sacramento region. The curriculum is now currently in over 40+ schools throughout the California Capital Region, serving over 6,000 students. Intel has led the effort, from starting the regional PLTW collaborative venture to investing nearly $500k to support classroom startup costs and training costs for every PLTW teacher within the Capital Region (nearly 150 teachers).

Most recently, PLTW and Next Ed were chosen as recipients of a $5 million Department of Education I-3 grant to demonstrate success rates of high need/nontraditional students in STEM course work as well as their potential success in college and careers in STEM fields. Intel supported the grant by committing $50,000 towards the required 10% private sector match. Intel further helped by bringing other regional leaders to the table resulting in over 23% private matching funds, far exceeding the required amount. The grant will help PLTW expand to over 60 schools, reaching over 10,000 students in the Capitol Region.

Intel Educator Professional Development Programs: Investing in the Teacher Workforce

Intel does not focus solely on talented students. We also invest heavily in the teacher workforce and teacher preparation and professional development. We understand that behind every successful student regardless of the level is a teacher providing needed inspiration and guidance.

Intel Math

One of the most successful professional development programs developed and supported by our company is Intel Math. Mathematics, a subject not generally the strength of elementary school teachers, is the essential language of science, engineering and technology. Intel Math increases teachers' understanding of mathematics and confidence in teaching the subject, which makes a real and measurable difference in the time they spend on instructing students, the enthusiasm they show for the subject, and in what their students learn.

Intel Math is an 80-hour professional development course in mathematics content for K-8 teachers. The program was adapted from the Vermont Math Initiative developed by Dr. Ken Gross. The course is collaboratively taught by a practicing mathematician and a mathematics educator. One of the goals of Intel Math is that teacher participants deepen their own understanding of math through problem-solving.

Intel Math "is designed to close the gap between insufficient mathematics training of elementary school teachers and the demands of the contemporary mathematics classroom" (Kenneth Gross, on VMI), and places emphasis on deepening the teacher participants' understanding of core K-8 mathematics concepts. Studies showed that elementary school teachers were often uncomfortable in teaching math to their students. This problem stemmed from their own fundamental lack of knowledge of math concepts.   A recent study of the impact of the training on Arizona teachers showed that the students of Intel Math-trained teachers scored significantly higher on the AIMS (Arizona's Instrument to Measure Standards) test than the students of comparable elementary school teachers.

Intel supports the Arizona College and Career Ready Standards initiative because more rigorous standards raise expectations, and today's students need a higher base of academic knowledge to be successful in college and careers. As previously mentioned, International tests and benchmarks consistently demonstrate that U.S. students score lower and lag behind international counterparts. Intel believes that the state standards like Arizona's College and Career Ready Standards offer a strong platform for closing that gap.

We not only support the standards but we are also have partnerships with school districts, AZ state department of education, teacher and higher education to help teachers transition to new standards. These partnerships cover statewide engagements to support student achievement in K-8 Mathematics in support of the Arizona College and Career Ready standards by building capacity through intensive professional development. In order to deliver Intel Math we partner with the University of Arizona and the Institute for Mathematics & Education (IM&E) which became the national training partner for Intel Math, responsible for overseeing the implementation and dissemination of the Intel Math program in various states across the country including Arizona. As of 2012, 10 states in addition to Arizona were implementing Intel Math, reaching over 1400 elementary school teachers.

The Arizona Board of Regents (ABOR) supports partnerships designed to increase academic achievement of students in core subjects by enhancing the content knowledge and teaching skills of classroom teachers in high-need schools. ABOR chose to focus on projects that incorporate the Intel Math curriculum to help K-8 teachers in hard-to-serve communities become highly-qualified and teach to the new Arizona Common Core Standards in mathematics. Three project teams – from University of Arizona, Northern Arizona University, and Prescott College – were funded and partnered with K-12 school districts to provide professional development for K-8 teachers.

Additionally in Arizona, very successful partnerships between the Arizona Department of Education and Northern Arizona University provided Intel Math professional development focused on supporting teachers in high need, hard-to-serve communities.

Intel Teach

Intel's signature program for teacher professional development is Intel Teach which has been offered for over 12 years in the United States and 70 countries worldwide. Intel Teach has trained over 500,000 teachers here in the U.S., 23,000 in Arizona and 11 million world-wide. The Intel Teach Program empowers teachers to achieve common core and state standards implementation while developing the students' problem solving, critical thinking, communication, and collaboration skills. These skills are essential for college and career-readiness in an information age.

Partnering with experts in online education and educational technology, Intel has redesigned its proven professional development as the basis for Intel Teach Elements, a series of interactive, multimedia courses designed specifically for online and blended use by educators. The courses under the Intel Teach Elements program include key areas of instruction deemed important by educators: Project-Based Approaches, Assessment of 21st Century Skills, Educational

Leadership, Thinking Critically with Data, Collaboration, Science Inquiry, and Designing Blended Learning. The Intel Teach program is offered free of charge to including State and Regional agencies, districts, schools and other local institutions. Intel Teach is currently offered in 29 states.

Intel Educator Academy

A third professional development opportunity, the Educator Academy, is provided in conjunction with our Intel ISEF science competition. This professional development program is targeted at administrators at the state and local level as well as those from universities. This program reaches a smaller number of teachers than Intel Math and Intel Teach, but is an effective way to leverage an existing education program to add a professional development component at modest cost. Every year at Intel ISEF, Intel invites select educators to participate in the Educator Academy with all expenses paid by Intel. The Academy focuses on improving science education and the scientific quality of science fair projects. The participants receive a "hands on" view of how Intel ISEF works and how to organize their own science fairs. They meet with the organizers and judges about judging and rules, and receive the benefit of insights from scientists of the highest caliber. The participants also benefit from exposure to educators from other countries and gain a view of the international competitive landscape. In 2102, 37 educators from the United States participated in the Educator Academy.

Teachers Engage

Intel provides a program for teachers who have participated in our professional development offerings to continue their development and expand their collaboration. The Teachers Engage program is an online community of educators that is offered free of charge to any teacher. This community is an extension of Intel's commitment to education and classroom transformation through technology. Transforming education to meet the needs of today's learners requires ongoing support for teachers as they implement new teaching practices. Intel connects educators who integrate technology into the classrooms and promote student-centered approaches in the Teachers Engage online community. Teachers Engage offers 21st century classroom resources, online courses, and active dialogue within a global network. Participants gain a professional edge through collaborating and interacting with other educators, creating private learning spaces, and hosting or attending in live webinars. Approximately 18.000 educators are members of the Intel Engage community at www.engage.intel.com.

Additional Intel resources that support education and future Workforce Development

Intel Involved

An additional program that supports STEM education is our Intel Involved volunteer program. This program provides opportunity for employees to impart their knowledge, technical skills, and work experience to transform education in K-12 schools and universities near our site

communities. As volunteers they serve as role models and mentors to students in K-12 and higher education and are real world examples of the opportunity available in STEM careers.

Through the Intel Involved Matching Grant Program (IIMGP), the Intel Foundation extends the impact of that service by donating cash to qualified schools where Intel employees and retirees volunteer at least 20 hours in a year. In 2012, our employees volunteered over 235,000 hours in our local schools. The anticipated benefit to local schools, when the calculation of qualified hours is complete, will be approximately $2 million.

Additional Partnerships

Intel and the Intel Foundation do the vast majority of our work in education and philanthropy through partnerships. Partners are selected based on common goals and objectives for each program or initiative. Typically we involve government (local, state, federal, departments of education, etc.), other corporations, non-profit entities, and other funders such as private foundations. Our goal is always to maximize the impact of our investment by using our funding and influence to bring together coalitions that can greatly increase the scope and scalability of what we could do on our own. We believe that governments and their agencies are essential partners for scaling solutions. We believe other corporations bring real world experience and pragmatism - and often the kinds of marketing and communications skills that help to tell the story of critical work to a larger audience. We believe that non-profits in the education arena with a track record of effectiveness and impact help us to understand the needs and voices of the clients or 'customers' they serve so well. And of course other funders who share our goals and philosophy can help us attain a much larger impact.

Governor Brewer's Arizona Ready Graduation Rate Task Force

The Arizona Ready Graduate Rate Task Force is an excellent example of collaboration between business, early childhood, K12 and higher education partners, including the Maricopa Community College District, and the philanthropic community who are focused on developing and scaling practices, programs and policies that decrease the number of students who drop out of high school and increase the graduation rates of college and career ready students. Key areas of focus include enhancing and expanding the successful career and technical education programs across the state which are demonstrating high rates of high school completion and post-secondary education course taking.

Additionally, other innovative approaches to accelerating education and skills development, increasing high school graduation rates and post-secondary credential, certificate and degree attainment are being explored by "pulling into high school" what has traditionally been delivered in higher education, including proposals to eliminate college remediation by delivering support in high school. Additional considerations include expanding "early college and career high schools" and other grade 9-14 models, like the successful P-Tech program in New York and models being developed in states and regions across the US as part of the recent Department of Labor "Youth Connect" competitive grant process.   These programs are delivering significant results, in many cases, with students who have been over-represented in drop out statistics, and under-represented in post-secondary education. This is especially important in a majority

minority student population state like Arizona and these programs, policies and strategies offer unique opportunities for maximizing business, K12 and higher education partnerships.

Society for Science and the Public

One example of our partnerships is our extensive work with Society for Science & the Public (SSP), and the many other organizations involved in the Intel International Science & Engineering Fair (Intel ISEF) and the Intel Science Talent Search (Intel STS).

In the US alone, Intel ISEF and the many affiliated and feeder science fairs in 48 states reach an estimated 150,000 high school students. While we fund a total of $665,000 in scholarships for all of the top award winners in each of the 17 categories of research (including the Gordon E. Moore award of $75,000 to the grand award winner), hundreds of public and private entities provide an additional $2.3 million in scholarship awards in various special categories. Students from US science fairs account for 65% of the finalists in Intel ISEF.

Our Educator Academy brings teams of educators from five different states each year, together with comparable teams from countries all around the world. There they share best practices both in how to create and manage high impact competitions of their own, but even more importantly, how best to educate and prepare students as young scientists who can conduct independent research, break new ground in science, and compete effectively both at local fairs and at Intel ISEF. The Army, Navy, Air Force, National Institutes of Health and the National Academies of Science are all involved in providing research opportunities for students and scholarships for young researchers. The list of active partners in this vast effort encompasses public and private entities of virtually every stripe.

At the national level, Intel works with organizations such as the National Governors Association (NGA) and the Council of State School Officers (CCSSO) to advance education reform. Our Intel Teach program was recognized by the NGA in 2010 with its prestigious Public Private Partnership Award.

At the federal level, Intel was a founding member of "Change the Equation," a CEO-led initiative designed to answer the President's call to move the U.S. to the top globally in science and math education over the next decade. In support of the initiative, Intel has committed to provide professional development training to an additional 100,000 U.S. teachers over a three-year period through Intel Math, Intel Teach and our Intel ISEF Educator Academies.

Evaluation

Evaluation is a critical tool that we use both for continuous improvement of our programs, and to measure their overall impact. Our goals are to learn how to do our work more effectively, share what we learn for the benefit of other funders, help our grant recipients increase their impact, and ensure that we stay focused on effectiveness and scalability rather than on little jewels that might make us feel good, but cannot truly address the systemic issues we are targeting. At the same time, Intel takes a pragmatic approach to evaluation; it is entirely possible to spend as much or more time evaluating a program as implementing it. We try to ensure that we use evaluation as a means to increase impact rather than as an end in and of itself. Expenditures on evaluation are

kept proportionate to the size of the grant or program, and we strive to use evaluation to help our grant recipients increase their reach and impact without distracting them unduly from the tasks at hand. In some cases we have funded independent third party evaluations of our programs, as was the case with Intel Teach and Intel Math. In other cases the evaluation was conducted jointly by Intel Foundation staff and the grant recipient.

One example is our evaluation of the Undergraduate Research Opportunity (URO) initiative developed and managed in partnership with the Semiconductor Research Corporation (SRC). It is well-understood that as many as 50 percent of all undergraduates enrolling as freshmen in engineering, computer science and related degree programs will drop out or change majors before their junior year. The percentage of those who, on average, continue to graduate school for a masters or Ph.D. is far smaller. We had seen good evidence that giving these students - especially women and other underrepresented populations - the opportunity to do research while undergraduates greatly increased rates of retention and graduation in their field. The addition of supportive classes and discussion groups focused on explaining the why and how of graduate school also made a tremendous difference. Partnering with 14 universities and the SRC, Intel provided stipends that allowed 600 students to participate in undergraduate research. Our jointly conducted evaluation showed that more than 97 percent of those students completed an undergraduate degree in a technical major, and nearly half continued onto graduate school - overwhelming evidence of real impact and success. By virtue of having conducted the research and with these data in hand, the SRC has already been able to recruit a second funding partner, allowing them to increase significantly the number of university partners and student researchers.

An independent evaluation of Intel Teach, our teacher professional development program that has reached 600,000 teachers in the US and more than 10 million around the world, was conducted by experts at the Center for Children & Technology (CCT), associated with the Education Development Center. As with the evaluation of the SRC URO, our focus was on measuring real impact – i.e., changed teacher behavior, improved classroom learning, changes in attitude, etc. Using both formative evaluation - to assess and improve actual implementation - and summative evaluation - to measure overall impact - we have been able to stay on a path of continuous improvement and growth.

Conclusion

Education has been Intel's primary philanthropic focus for decades. Intel has over 200 programs in more than 70 countries that provide professional development for teachers, support and celebrate student achievement in science, technology, engineering, and math, and bridge the digital divide with relevant, local online content for educators, students and parents. Our experience in education worldwide has informed our understanding of the need for higher standards and more rigorous assessments for our students here at home.

In the past, the job of schools was to filter out the few natural scientists from the crowd and send them on to an elite education to become academics and researchers. Today, we need far more people with these skills to take positions in academia, in industry, in government. All young people need a far better grasp of technology and science simply to live in this increasingly complex and rapidly changing world inundated with data, climate changes, and revolutionary

advances in medical science. As microprocessor technology becomes ever more complicated, there is great value to Intel in increasing the diversity of the pool of people searching for answers to scientific questions, both profound and practical, especially given the persistent the lack of qualified American job applicants for our microprocessor manufacturing and research and development facilities.