



Investing in **RESULTS**

How Business Roundtable Is Supporting
PROVEN EDUCATION REFORMS



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Introduction

In 2013, Business Roundtable asked its members to commit a portion of their education-related philanthropy to reform efforts that, based on evidence, have raised student achievement in grades K–12. Proposals were solicited from programs, and an independent panel of experts rigorously reviewed the proposals based on whether the programs had proven results; transparent metrics; alignment with the Common Core State Standards; and the ability to expand to reach more students, teachers and schools. The expert panel then recommended five programs for funding.

Business Roundtable members subsequently directed more than \$15 million to the selected programs. Through these five programs, Business Roundtable member companies are helping:

- ▶ Advance student reading and math proficiency;
- ▶ Strengthen schools by improving leadership;
- ▶ Raise student test scores; and
- ▶ Produce greater numbers of highly qualified math and science teachers.

The programs chosen are already yielding measurable results. By focusing on what is working, the Business Roundtable Education Philanthropy Initiative shows that business philanthropy — strategically directed — can play an even more powerful role in lifting educational attainment throughout the country.

Choosing the Programs

Business Roundtable began the process by asking programs devoted to K–12 education reform to submit proposals for potential funding. To be eligible, programs must have advanced one or more of the following Business Roundtable priorities: science, technology, engineering and math (STEM) education; teacher quality; early reading; and alignment with the Common Core State Standards. In addition, Business Roundtable had particular interest in programs that:

- ▶ Employed innovative approaches to teacher education, training or professional development, particularly in high-demand fields (e.g., STEM);
- ▶ Used technology and applications to accelerate student success;
- ▶ Improved student achievement in one or more of the STEM-related subjects;
- ▶ Applied novel instructional techniques to ensure that all students are reading on grade level (particularly, but not limited to, reading by the end of 3rd grade);
- ▶ Raised college and career readiness; and
- ▶ Increased high school graduation rates and reduced remediation rates for students entering postsecondary education.

Finally, to be considered, each program had to provide:

- ▶ Rigorous, quantitative, independent research that demonstrated significant improvement in student outcomes;
- ▶ Evidence of successful replication;
- ▶ Confirmation of Common Core State Standards alignment; and
- ▶ Verification that the program had been in operation for at least three years with demonstrated results over time.

Goals of the Business Roundtable Education Philanthropy Initiative

- ▶ Link and leverage corporate America's philanthropic investments in education.
- ▶ Invest in programs that demonstrate (with at least three years' worth of data) that they work.
- ▶ Reduce duplication of effort among corporate philanthropy.
- ▶ Encourage corporate investment strategies to demand more from their grantees (e.g., setting goals and collecting data to measure impact).

Business Roundtable received 96 proposals from nonprofit organizations, schools, districts and states. The applications addressed a broad range of critical areas, including reducing dropout rates, improving classroom teaching, producing more high-quality teachers, enhancing school leadership and using technology to raise student learning. About half of the proposals dealt with STEM education.

Business Roundtable established a panel of five independent experts to review the submissions. The panelists represented academia, the education policy community and practitioners. Ten finalists were invited to appear before the panel to present their results, describe plans for scaling up coverage and respond to questions. After a rigorous evaluation, the panel recommended five programs for funding by Business Roundtable member companies.

The Five Programs Chosen and Their Impact on Education

Five national programs were recommended to Business Roundtable members for funding:

- ▶ **New Teacher Center (NTC)** — a program dedicated to improving student learning by accelerating the effectiveness of new teachers and school leaders and improving teacher retention.
- ▶ **National Institute for School Leadership (NISL)** — a program that raises achievement schoolwide by enhancing the leadership skills of principals.
- ▶ **Success for All (SFA)** — a program that uses cooperative learning and innovative teaching methods to ensure that all students achieve proficiency in reading in the early grades.
- ▶ **Spatial-Temporal (ST) Math®** — a program that improves student proficiency in math and problem-solving through technology-based visual games.
- ▶ **The National Math and Science Initiative's (NMSI) UTeach Expansion Program** — a program focused on increasing the number of high-quality math and science teachers through replication of a unique, university-based curriculum.

All of the programs tackle critical challenges in education with effective remedies. For example, **NTC** uses rigorously trained, highly skilled mentors to raise the effectiveness of new teachers through preparation and ongoing support. Studies show that teachers who received two years of NTC induction produce greater student gains in math and reading than do teachers who received less intensive mentoring. In addition, NTC-trained teachers are much more likely to stay in their job (between 76 and 94 percent retention compared to the national average of 54 percent).

NISL conducts comprehensive training with an emphasis on school principals. The NISL program strengthens each principal's capacity as a strategic thinker, instructional leader and steward of a schoolwide culture of high achievement. By enhancing school leadership, the program has yielded

statistically significant and sustained student gains in reading and mathematics compared to schools that did not have NISL-trained leaders.

SFA employs teacher training and novel instruction to ensure that students become proficient in reading in the early grades, a necessity for long-term success. The program uses technology, innovative teaching methods, tutoring and “solutions teams” to raise the achievement of entire classrooms. This schoolwide reform is implemented only if an overwhelming majority of teachers in a school commit, through a referendum, to the training and program curriculum. The benefits are clear, as numerous studies have shown that the program has increased reading achievement; cut the achievement gap between African American, Hispanic and white students; and helped teachers become more effective instructors.

ST Math aims to raise students’ math proficiency. The program uses innovative, game-based, instructional software integrated with classroom instruction. The interactive, graphically rich animations teach mathematical concepts through visual representation to improve understanding and problem-solving skills. Schools that fully implement ST Math consistently see a doubling of math proficiency on state standardized math assessments.¹

Finally, the **NMSI’s UTeach Expansion Program**, which originated at the University of Texas at Austin, seeks to boost the number of highly qualified STEM teachers in the nation’s secondary schools. The program recruits undergraduate math and science students and gives them the opportunity to earn both a STEM degree and a secondary teaching certification without adding time or cost to their four-year degree program. Forty-four universities across the United States are implementing the UTeach program. Between 2012 and 2014, the first cohort of 13 universities produced 653 new STEM teachers, who are teaching the next generation of STEM students. As more programs become established and mature, the number of highly qualified STEM teachers will continue to grow.

How Business Roundtable Member Contributions Are Scaling Up Impacts

The goal of the Business Roundtable Education Philanthropy Initiative was to expand the impact of the five proven programs. The programs already had demonstrated results and continue to do so; thus, the emphasis was to reach more school leaders, teachers and students. The programs received funding in 2014, and all are in the process of expanding their efforts. For example:

- ▶ **NTC** reports that Business Roundtable member contributions have significantly helped advance its growth plan, which — starting in 2013 — is to increase training from 23,000 new teachers to 60,000. The plan targets high-poverty urban and rural districts, where new teachers tend to be concentrated. Some of the Business Roundtable member support is also being used to build the organizational and technical capacity of the NTC.
- ▶ **NISL** is using Business Roundtable member funding to increase the number of scholarships to principals so they can attend the Executive Development Program. The focus of the scale-up is on Fayette County, Kentucky, where by 2016, NISL will have trained 250 school principals overseeing the learning of an estimated 137,000 students.

“With the selection of these programs, Business Roundtable is making progress toward the goal we put forth with this K–12 education initiative: recognize what’s working and begin to help achieve greater results for all American students.”

Rex W. Tillerson, CEO of ExxonMobil and Chair of the Business Roundtable Education and Workforce Committee

- ▶ **SFA** is using the Business Roundtable member support to bring its reading program to an additional 31 schools, 25,000 children and 860 educators.
- ▶ **ST Math** is using Business Roundtable member contributions to expand its program to more than 90,000 additional students (over the 800,000 students already covered as of fall 2014) and 3,200 additional teachers, as well as developing new middle school curricula and professional development-teacher training modules.
- ▶ Finally, **NMSI's UTeach Expansion Program** is using Business Roundtable member funding to develop an alumni mentoring network for UTeach graduates around the country, create a national UTeach community across the 44 universities and provide grants to UTeach programs.

A Lasting Legacy

Ten years ago, a report from Johns Hopkins University noted that “the evidence-based policy movement remains the best hope for genuine reform of education in the U.S.”² However, it also noted that the financial commitment to research-based practices often has been more rhetorical than real, with many education reforms funded based on good intentions rather than evidence of effectiveness.

The Business Roundtable Education Philanthropy Initiative was an effort to change that tradition by asking companies to:

- ▶ Use corporate giving alongside nonprofit investments to amplify the impact of education reforms;
- ▶ Emphasize the use of metrics to measure the success of philanthropic investments and future giving; and
- ▶ Support programs that are working so that more students can reap the benefits of effective interventions.

The programs that received funding under the Business Roundtable initiative all praised the rigorous vetting process and welcomed the emphasis on reforms that demonstrate results. They also hoped other philanthropic organizations might join together to develop a similar, coordinated process to identify worthy candidates for potential support by multiple foundations. Using a single, rigorous vetting process to identify programs for funding allowed the grantees “more time to do great work and less time retelling our story to individual funders,” as one recipient stated.

Summaries of the Individual Projects

Building and Retaining Effective New Teachers

The New Teacher Center (NTC) is a national nonprofit dedicated to improving student learning by boosting the effectiveness of new teachers and school leaders. NTC works with schools districts, state policymakers and educators across the country to give new teachers the tools and support needed to drive classroom learning using one-on-one mentoring from experienced teachers and professional development. NTC also concentrates on building the capacity of principals and other site leaders to create environments in which new teachers thrive.



How the Program Works

NTC induction programs are designed to accelerate the growth and effectiveness of new teachers. Research has shown that new teachers are less able to influence student learning than those with more experience. Moreover, many new teachers (up to 41 percent) leave their job after one year if they do not receive significant early support.³ Helping new teachers thrive early in their careers benefits all students but particularly those in low-income school districts, where new teachers are more likely to serve.⁴

NTC develops the capabilities and increases retention of new teachers through its comprehensive teacher induction program. The program gives new teachers professional development and one-on-one mentoring with experienced, carefully trained teachers who reside in the same district. NTC selects mentors based on their mastery of subject matter, instructional skill and experience. Mentors receive intensive professional development through NTC's gold standard Mentor Academy Series before and during their service. NTC mentors are fully released from their teaching duties to work individually with new teachers for an hour and a half each week for at least two years. Each mentor supports a caseload of 12 to 15 teachers, with the mentors and teachers paired according to the subject areas they cover. A mentor's typical duties include meeting one on one with his or her teachers, observing lessons, helping develop lesson plans and advising teachers on approaches for meeting their students' unique needs.

NTC also helps build the environment needed to support high-performing teachers through its principal induction programs, which focus on principals as teacher developers and shapers of the school culture for learning. Throughout the two-year program, principals work together with their coaches to gather student performance data and evidence of teaching practice via observation protocols, classroom visits and other similar strategies. Through participation in the program, principals receive the skills needed to combine these multiple data sources and use them to deliver feedback aimed at improving instruction and teacher performance.

NTC has estimated that the cost of a high-quality induction program runs between \$6,000 and \$7,000 per teacher, which is at least 50 percent less than the cost of losing and replacing a teacher after one year.⁵ The cost to run the NTC program is covered through fee-for-service contracts and support from philanthropic organizations. Schools and districts generally cover about half of the funds needed, while the remainder often is collected from the state and philanthropic organizations. Approximately 40 percent of NTC revenue comes from national funders, which allows NTC to expand its reach, develop new products and services, and build the organization's infrastructure.

Results

NTC continuously evaluates its effectiveness in several areas, including teacher practice, teacher retention and student learning. The most recent results — not yet published — come from a federally funded external evaluation of NTC's effectiveness in a particular school district. The study shows growth in teacher retention from 72 percent before NTC began work in the district to 94 percent after two years of working in the district. Preliminary results from the same evaluation also find that after two years of induction, NTC-supported new teachers demonstrated student achievement on par with that of veteran teachers (three-plus years of experience) in math, reading and English language arts.⁶

Finally, NTC recognizes that improving student learning is the ultimate goal of the program. NTC and third parties have looked at test scores as one way to assess learning growth, and NTC is also piloting other research to assess student performance. A federally funded randomized controlled trial found that beginning teachers who received two years of induction produced greater student learning gains by the third year when compared with those who received less intensive mentoring. These gains were statistically significant enough to move the average student from the 50th percentile up 4 percentile points in reading and 8 percentile points in math.⁷

“Our model is increasing overall teacher retention and improving student achievement while reducing district teacher recruiting costs. We are making sure every student, regardless of their zip code, gets a remarkably talented teacher. The BRT initiative has helped us expand our reach and, ultimately, impact more teachers and students across the country. We appreciate the opportunity to engage with corporate partners who share our commitment to improving education in the U.S.”

Ellen Moir, CEO of NTC



Impact of Business Roundtable Member Company Contributions

NTC reports that Business Roundtable member contributions have significantly helped advance its growth plan, which — starting in 2013 — is to expand training to 60,000 new teachers. The plan targets high-poverty urban and rural districts, where new teachers tend to be concentrated, the need for effective teachers is greatest and new teachers are less likely to have the support needed to help them thrive. The goal is to reach half of these teachers online and half through face-to-face work in the district.

Business Roundtable member contributions have allowed NTC to:

- ▶ Expand online mentoring to more new science, technology, engineering and math (STEM) teachers;
- ▶ Build out additional content — including K–6 STEM content — for its online model;
- ▶ Develop online versions of tools and resources to help teachers and mentors;
- ▶ Capture much richer program-level data; and
- ▶ Support teachers in more districts and schools across the country.

Enhancing the Skills of Principals

The National Institute for School Leadership (NISL) raises the strategic thinking, instructional knowledge and leadership abilities of principals. By doing so, NISL enhances overall school performance, teacher effectiveness and, most important, student achievement. NISL's rigorous program for school leaders gives principals the skills and knowledge to turn around low-performing schools and make good schools better. Results bear this out: Students in schools led by NISL graduates consistently show higher outcomes in math and literacy. The program has trained approximately 8,000 principals over the past 10 years.



How the Program Works

Studies have shown that principals significantly influence the quality and effectiveness of teachers, school culture and, ultimately, student learning. Recent research finds that highly effective principals retain and recruit better teachers and are more likely to provide their teachers the support, training and motivation they need to succeed. As a result, effective principals can increase student scores up to 10 percentile points on standardized tests in just one year and improve student performance in other areas, such as attendance and behavior.⁸

NISL promotes schoolwide reform through its Executive Development Program (EDP) for principals. Participants in the program learn how to be strategic thinkers, instructional leaders and creators of a caring culture in which all students meet high standards. The 18-month program coaches principals in best practices in teaching and learning, subject-area content knowledge, and leadership skills and methods. The program covers four fundamental themes:

- ▶ **Leadership knowledge and skills.** Principals learn and practice strategic thinking and team-building skills, how to create a strong school culture, how to use data to make decisions, and the management skills needed to turn around schools.

- ▶ **Best practices in teaching and learning.** Principals learn about teacher coaching and supervision, standards-based classrooms, formative assessments, building instructional teams, creating a compelling school vision, using differentiated instruction, and creating professional learning communities.
- ▶ **Subject-area knowledge.** Participants are taught how to create excellent schoolwide programs in English language arts (ELA), mathematics and science and how to build strong instructional practices in the content areas.
- ▶ **Best practices for delivery of adult curriculum.** Principals study how to conduct 360° assessments, use job-embedded learning and simulations, conduct case studies, facilitate group discussion, and use extended periods of study.

NISL offers several variants to its training program. In the least expensive model, only principals go through the program. A more comprehensive approach involves each school sending a principal and a few educator-leaders to training. Finally, schools can also add individual coaching to supplement the group learning time in the EDP. Program costs range from \$5,000–\$15,000 per school in most cases. If funds are available, NISL also offers limited scholarships in certain situations, such as when a large district participates in the program.

NISL also offers a train-the-trainer delivery model, in which NISL Master Faculty train state or district leaders to deliver the program on their own. Trainers go through the EDP and a Facilitation Institute to become NISL-certified.

Results

Numerous independent studies have confirmed the benefits of the NISL program in improving the effectiveness of school principals and leaders. For example, a 2011 study examined the impact of NISL’s EDP on student achievement in 38 Massachusetts schools. The results indicated the NISL-trained principals outperformed their peers in raising student achievement. The NISL-led schools achieved statistically significantly higher student scores in both ELA and mathematics. The higher scores were equivalent to all students in the 38 schools receiving more than a month of additional learning.⁹

Another study examined the impact of the NISL leadership program on student achievement in ELA and mathematics in Pennsylvania schools from 2006 to 2010. The study found that schools led by EDP principals improved at a greater rate than comparison schools. This meant that about 1,225 more students between 2008 and 2010 achieved reading/ELA proficiency and 1,089 more students achieved math proficiency than would otherwise be expected.¹⁰



Impact of Business Roundtable Member Company Contributions

NISL is using the Business Roundtable member contributions to increase the number of scholarships it provides so principals in Fayette County, Kentucky, can attend the EDP. By fall 2016, NISL will have trained 250 school principals in the county, who will oversee the learning of an estimated 137,000 students — more than 20 percent of all Kentucky public school students.

“Our work demonstrates the critical role principals play in improving instruction and student learning and shows that providing rigorous professional development to current leaders is one of the most efficient ways to increase the number of high performing schools in our country.”

Jason Dougal, CEO of NISL

Ensuring Children Can Read

Success for All (SFA) is a schoolwide program that focuses on ensuring that every child, from prekindergarten to grade 8, becomes proficient in reading. The program, developed 29 years ago by two Johns Hopkins researchers, targets high-poverty schools in which more than half the children are at risk of illiteracy. It includes daily 90-minute reading classes with students working in teams, grouped by reading ability. Instruction emphasizes phonics, comprehension and team participation. SFA has proven to have a positive impact on nonacademic concerns such as behavior, attendance and parental involvement. A critical component of SFA's success is the training and ongoing professional development it provides to teachers. These methods are designed to promote reading proficiency, but they also help teachers improve instruction in every subject they teach.



How the Program Works

SFA works closely with key stakeholders in every school that considers adopting the program. The initial engagement process involves several days of on-site consultation with school leaders and teachers. Assuming there is district and principal support, teachers vote on whether to implement SFA. To ensure a schoolwide commitment, SFA requires that 75 percent of the teachers approve the referendum to adopt the program.

SFA program implementation involves the following key elements:

- ▶ **Teachers are trained in proven instructional strategies.** Teachers receive professional development in instructional strategies, including cooperative learning, phonics and metacognitive comprehension skills. The instructional techniques learned and used by teachers are unique to the SFA program.
- ▶ **Student progress is monitored.** Student reading is frequently assessed. Children are placed in instructional groups according to their performance and are provided tutoring if they are below grade level. A computer monitoring system helps track student progress and flags individual children for possible intervention.

- ▶ **Tutors help struggling readers.** Students who are not at grade level receive computer-assisted one-on-one or small-group tutoring to catch up.
- ▶ **A “solutions team” addresses nonacademic factors.** A solutions team in each school works to solve nonacademic barriers to success. These teams reach out to parents, community agencies and school staff to deal with issues such as attendance, behavior, health and home literacy issues.
- ▶ **Continuous improvement is emphasized.** School leaders, teachers and other school staff collaborate to set quarterly goals, select leverage points for change, measure progress and celebrate success.
- ▶ **Staff receive coaching and support.** Intensive coaching is provided for all school staff. Staff also receive on-site assistance and access to resources through webinars, electronic data-sharing and other digital communication.

The cost for implementing SFA generally runs \$100,000 for the first year, \$50,000 in year two and \$30,000 per year thereafter. Schools are expected to use Title I funds, state funds or private contributions to cover these expenses, particularly after the first year. To help defray start-up costs, SFA raises funds to provide schools \$50,000 start-up grants.

Results

SFA is a highly effective and thoroughly evaluated schoolwide improvement model. Several independent and comprehensive studies examining SFA's effectiveness over the years have found consistently positive results. In addition, SFA collects data on student outcomes in many of its states with established programs. These studies are listed on the organization's website.

For example, Virginia elementary schools using the SFA reading program made gains on the Virginia Standards of Learning reading test. From 2013 to 2014, these schools showed a 6 percentage point increase in the number of students in grades 3–5 who scored proficient or advanced, while Virginia schools overall declined 1 percentage point. Likewise, Arizona middle schools implementing SFA made significant gains on the Arizona Instrument to Measure Standards reading scale. From 2009 to 2010, SFA middle schools in Arizona had a 7.5 percentage point increase in the number of students in grades 6–8 who met or exceeded standards while, overall, Arizona middle schools gained only 4.7 percentage points.¹¹



Impact of Business Roundtable Member Company Contributions

SFA is using the Business Roundtable member support to bring its reading program to an additional 25,000 children beyond SFA's current student body of 450,000. Moreover, an additional 860 teachers will receive support, training and knowledge that will enhance and sustain their teaching skills in all subjects.

“Success for All helps change the outcomes for poor and socially disadvantaged children. Put simply, the world is open to those who can read and closed to those who cannot. The literacy program developed by SFA nearly thirty years ago has been consistently proven effective. With the support of the Business Roundtable Members, we are helping build a literate, healthy, and productive society.”

*Dr. Robert Slavin, Co-Founder of SFA
and Director of the Center for
Research and Reform in Education at
Johns Hopkins University*

MIND Game-Based Math Software

Research Institute

www.mindresearch.org
www.stmath.com

Spatial-Temporal (ST) Math® is game-based instructional software designed to boost math comprehension and proficiency through visual learning. Integrated with K–12 classroom instruction, ST Math uses computer games and interactive, graphically rich animations that visually represent mathematical concepts to improve conceptual understanding and problem-solving skills.

ST Math was created by the MIND Research Institute, which specializes in the development of innovative, visually based computer games grounded in how children learn. As of October 2014, ST Math was serving 800,000 students and 31,000 teachers in 2,500 schools across 40 states.



How the Program Works

ST Math is available for purchase by schools and school districts, and access to a minimum of two full grade levels is required. Costs include purchase of a software license and site support for professional development and program start-up. Most costs occur in the first year, with a nominal annual renewal fee charged per school after the first year of the program. This fee helps offset MIND's ongoing support costs, program upgrades and data evaluation. Because MIND targets low-performing K–12 schools, program costs typically are a blend of local school contributions (often federal Title I grants) on the order of about 25 percent with the rest contributed through MIND investments and other philanthropic support. The total cost of the program runs between \$25 and \$29 per student.

Certain conditions generally are required for a successful launch of ST Math in a school or district:

- ▶ **Collaboration.** A collaborative partnership must exist between local education agencies and other enabling entities, such as local nonprofits, the business community and foundations.
- ▶ **Commitment to implementation.** Schools must have the equipment (students must have access to standard computers and/or tablets), time and space to implement MIND's ST Math program as recommended and be committed to the implementation requirements, including continued teacher training.
- ▶ **Training.** Principals must attend the Principal's Institute, and all participating teachers must attend online or in-person training (each school also is assigned an education services specialist, who periodically follows up with the school and monitors its progress).
- ▶ **Additional philanthropic support in some cases.** Philanthropic support may be needed to assist high-need schools.

- **Broad community support.** Community support (through parent-teacher associations, local education agencies, nonprofits, the business community and foundations) is encouraged to ensure that the program flourishes.

ST Math is used in conjunction with traditional classroom teaching and is aligned to the Common Core State Standards. The organization suggests that students use the program in two 35- to 40-minute sessions per week. Teachers also can assign exercises for students to do at home.¹² A demonstration video involving fractions can be found on the organization's website.

Results

MIND as well as other researchers have conducted numerous evaluations of the ST Math program throughout the country. Results show that schools that fully implement ST Math see double — and even triple — the growth in math proficiency over comparable schools not using ST Math. For example, District of Columbia Public Schools (DCPS) using the ST Math program in blended learning environments saw triple growth on math proficiency compared to other DCPS schools, according to an analysis released in November 2014.¹³ MIND evaluated the DC Comprehensive Assessment System math scores of 1,135 3rd, 4th and 5th graders at 17 DCPS campuses that had fully implemented ST Math for two years. They found that those schools experienced a 19-point gain in the percentage of students scoring proficient or advanced in math since 2012. DCPS schools that had similar 2012 math performance but did not use ST Math experienced a 5.2 percentage point gain over the two years. These results mirror an analysis done in 2013, which observed triple student gains in ST Math schools versus non-ST Math schools in the District of Columbia.¹⁴

Also released in November 2014, independent education research firm WestEd found that just one year of ST Math use in classrooms can move a school that was performing at the 50th percentile in the state up to the 66th percentile in the state. WestEd measured the impact of MIND's ST Math program in 209 2nd through 5th grades — encompassing more than 19,980 students at 129 California schools — that fully implemented the program in a blended learning environment.

The report used several models to measure ST Math's impact. Those grades using ST Math for one year had 6.3 percent more students scoring proficient or better on the California Standard Test (CST), compared to those at similar schools without the program. Remarkably, the study found that almost all of the improvement was reflected in increases in students scoring advanced, not merely proficient, on the tests. Students in those classes using ST Math exhibited advanced CST math scores at a rate that was, on average, 5.6 percentage points higher than others.¹⁵



Impact of Business Roundtable Member Company Contributions

Contributions from Business Roundtable member companies have helped MIND bring ST Math to approximately 90,000 additional students over the previous 800,000. This expansion includes training and supporting an additional 3,200 teachers. A portion of the funds also is being used to develop new curricula on financial literacy, develop more in-depth professional development and host math fairs in certain school districts.

"The Business Roundtable's support has been a catalyst for MIND Research Institute. As we intensified our efforts to scale to reach more students and teachers with ST Math over the last two years, BRT members were responsible for nearly a quarter of our total growth. BRT is definitely moving us closer to achieving our mission to ensure that all students are mathematically equipped to solve the world's most challenging problems."

*Matthew Peterson, Ph.D., Co-Founder,
CEO and Senior Scientist of MIND
Research Institute*

Producing High-Quality Math and Science Teachers To Meet Demand

The National Math and Science Initiative's (NMSI) UTeach Expansion Program seeks to replicate nationwide a unique teacher preparation program designed to grow the number of qualified science, technology, engineering and math (STEM) teachers in U.S. secondary schools. Surveys show that highly qualified STEM teachers are in short supply; for example, about 28 percent of high school math teachers currently do not hold a degree in their field.¹⁶ Moreover, studies suggest that the United States needs to produce at least 10,000 highly qualified STEM teachers per year to sustain economic growth. Unfortunately, the current production rate of math and science teachers is not keeping up with demand.¹⁷ UTeach is helping counter this trend by recruiting undergraduate math and science students and giving them the opportunity to earn both a STEM degree and a secondary teaching certification without adding time or cost to their four-year degree programs.

Currently, 44 universities across the country, including the University of Texas (UT) at Austin (home of the original UTeach program), are implementing the UTeach STEM Teacher Preparation Program. The number of UTeach graduates is steadily growing, with 521 degrees and certifications awarded in 2014.¹⁸



How the Program Works

The UTeach program began in 1997 at UT Austin to address the shortage of qualified secondary math, science and computer science teachers and raise the quality of those entering the field. Recognizing the success of the program, NMSI began working with the UTeach Institute in 2007 to expand the program to colleges and universities across the country. The program has since expanded to 44 universities in 21 states and the District of Columbia.

The goal of the UTeach program is to create teachers who have deep knowledge of their subject, are trained in effective teaching methods and enter the field with some classroom experience. UTeach recruits candidates from the universities' math and science programs early in their academic careers. To see if teaching is right for them, freshmen are given the opportunity to experience public school teaching on a limited, supported basis. Individuals who stay in the program then must complete a curriculum that includes:

- ▶ All rigorous content courses needed to fulfill a STEM degree;
- ▶ Additional courses designed specifically for future teachers;
- ▶ Domain-specific education courses that focus on pedagogical instruction specific to STEM subjects; and
- ▶ An intense final clinical teaching experience paired with a weekly seminar.

UTeach graduates exit the program with both a STEM degree and wide-ranging teaching skills, including:

- ▶ The ability to implement research-based teaching strategies;
- ▶ The knowledge to employ a variety of student learning methods;
- ▶ The ability to analyze student assessment to improve classroom instruction; and
- ▶ The knowledge, preparation and credentials to successfully teach Advanced Placement or International Baccalaureate courses.

To expand the UTeach program, NMSI works with interested universities to create a new university unit or department-like entity that operates using a combination of university funds and private money. Universities typically are awarded \$1.4 million grants over a five-year period to support start-up (the grant covers approximately 40 percent of start-up costs). In addition, NMSI contracts with the UTeach Institute to provide the university with technical assistance, evaluation services and curricula for the nine core UTeach courses. The curricula come with extensive instructor and program support, including instructor notes, rationales, lessons learned, recorded interviews and discussions, videotaped activities, and samples of student work.

Results

UTeach results can be measured in three areas: success in graduating knowledgeable and certified teachers, success in those teachers entering and staying in the field, and the effect of UTeach teachers on student learning.

In terms of graduating knowledgeable, skilled and certified teachers, the UTeach Program has grown from the initial two graduates at UT Austin in 2000 to a combined total of 2,144 graduates from UT Austin and other expansion programs in 2014. According to data from the UTeach Institute, more than 6,800 STEM majors were enrolled in the program in spring 2015.¹⁹ By 2020, the UTeach Institute expects to produce a total of 8,000 new STEM teachers.²⁰

In terms of employment and retention, UTeach graduates are sought after by schools and districts for their strong content knowledge and experience in instructional methods. Since 2008, 87 percent of program graduates have entered teaching, with nearly 76 percent of UTeach graduates remaining in the profession compared with the national average of 54 percent for all teachers across all subjects. Moreover, 66 percent of UTeach graduates are teaching in schools with a majority low-income population.

In terms of the impact on student learning, UTeach is just beginning to produce the number of teachers necessary to effectively measure results. However, a 2010 international study confirmed that teacher subject knowledge does have a significant effect on student achievement. That study determined that a one standard deviation increase in teacher subject knowledge raises student achievement by about 10 percent of a standard deviation.²¹ Likewise, some early UTeach-specific

“Ensuring that new teachers stay in the classroom is an important part of the UTeach model. BRT member funds helped launch the UTeach Alumni Mentoring Program that pairs recent UTeach graduates with experienced UTeach teachers who can provide guidance on preparing lessons, engaging students, and responding to classroom challenges.”

Matthew Randazzo, CEO of NMSI

research using classroom observations suggests that UTeach teachers are more effective than non-UTeach graduates to a statistically significant degree.²² Additional research on UTeach is under way through a study funded by the Institute of Education Sciences, and NMSI has developed a research agenda for the UTeach Expansion Program.



Impact of Business Roundtable Member Company Contributions

NMSI is using Business Roundtable member contributions to support new graduates, create a national UTeach community and provide grants to UTeach programs. Induction support for new teachers is particularly important. To maintain and enhance the skills of UTeach graduates, NMSI has used Business Roundtable support to provide professional development scholarships to graduates from 15 universities. In addition, NMSI is collaborating with UTeach alumni to pilot an online mentoring program to connect graduates nationwide.

Funding has also enabled NMSI to work with the new UTeach STEM Educators Association to build a community to share best practices in STEM education, refine UTeach data collection and improve alumni tracking. Finally, Business Roundtable member support is being used to provide student services for the new UTeach program at Florida International University.

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