FOSTERING CHANGE:

Ideas and Best Practices for Diversity in STEM Teaching in K-12 Classrooms

About the Smithsonian Science Education Center

The Smithsonian Science Education Center (SSEC) is the only unit at the Smithsonian Institution that is solely dedicated to formal K-12 science education reform. The SSEC was established in 1985 as the National Science Resources Center (NSRC) under the sponsorship of two prestigious institutions: the Smithsonian Institution and the National Academy of Sciences. In 2012, our name changed to the Smithsonian Science Education Center to reflect our mission: to transform and improve the learning and teaching of science for K-12 students. We are dedicated to the establishment of effective science programs for all students. To contribute to that goal, the SSEC develops comprehensive K-8 science curriculum materials; and, we support the systemic needs of schools, districts, states, and countries through our proven Leadership and Assistance for Science Education Reform (LASER) model.

About Shell Oil Company

Shell is a leading oil and gas producer in the deep water Gulf of Mexico, a recognized pioneer in oil and gas exploration and production technology and one of America's leading oil and natural gas producers, gasoline and natural gas marketers and petrochemical manufacturers. Finding innovative and responsible ways to secure the world's future supply of energy can't be done by few. It's a monumental undertaking, and it's going to require the input, knowledge and creativity of people around the planet. This is why we don't look at inclusion as an act of corporate goodwill. We don't see it simply as "the right thing to do." To Shell, having a diverse workforce is the only way we can accomplish our greatest company objectives. Yet, even more importantly, we see it as a matter of global necessity. The energy challenges we face are enormous – and we're endeavoring to put the best minds in the world to work on developing the solutions. At Shell, we have come to affectionately embrace our differences. We rely on diverse perspectives in order to make progress that has the world's best interests at heart. Through active recruitment efforts we are succeeding in creating an ever more diverse workplace. But to us that is not the goal, only the result of our approach. The true mark of our success is that inclusion has become embedded in everything we do as a company. It is beginning to define us. It is securing the future of our company, no doubt. But we also feel that in some ways we are helping to secure the future of society itself. And we believe that is a worthy step in the right direction.

About FSG

FSG is a mission-driven consulting firm supporting leaders in creating large-scale, lasting social change. Through strategy, evaluation, and research we help many types of actors—individually and collectively— make progress against the world's toughest problems. Our teams work across all sectors by partnering with leading foundations, businesses, nonprofits, and governments in every region of the globe. We seek to reimagine social change by identifying ways to maximize the impact of existing resources, amplifying the work of others to help advance knowledge and practice, and inspiring change agents around the world to achieve greater impact. As part of our nonprofit mission, FSG also directly supports learning communities, such as the Collective Impact Forum, Shared Value Initiative, and Impact Hiring Initiative, to provide the tools and relationships that change agents need to be successful. Learn more about FSG at www.fsg.org.

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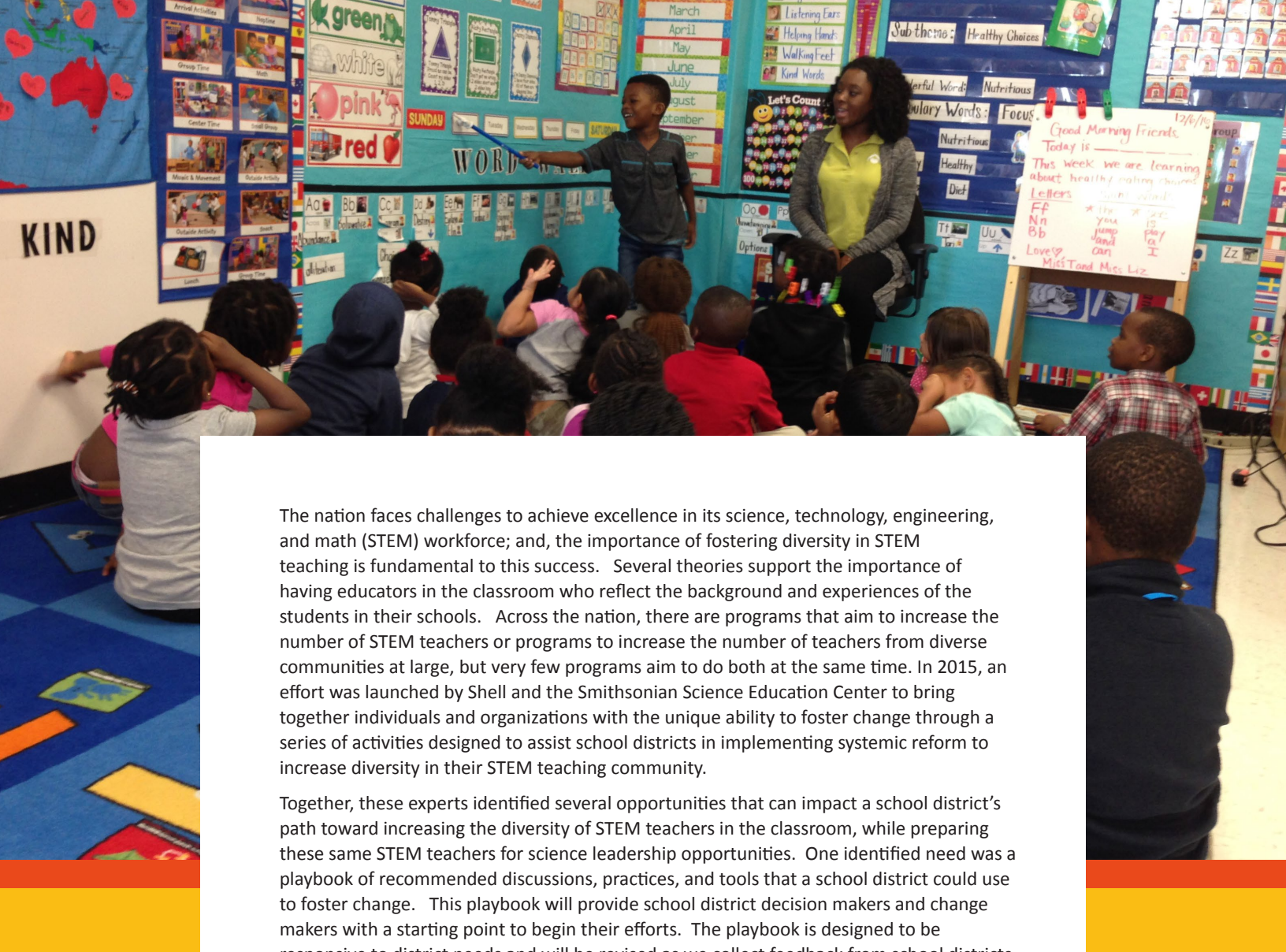
The nation faces challenges to achieve excellence in its science, technology, engineering, and math (STEM) workforce; and, the importance of fostering diversity in STEM teaching is fundamental to this success. Several theories support the importance of having educators in the classroom who reflect the background and experiences of the students in their schools. Across the nation, there are programs that aim to increase the number of STEM teachers or programs to increase the number of teachers from diverse communities at large, but very few programs aim to do both at the same time. In 2015, an effort was launched by Shell and the Smithsonian Science Education Center to bring together individuals and organizations with the unique ability to foster change through a series of activities designed to assist school districts in implementing systemic reform to increase diversity in their STEM teaching community.

Together, these experts identified several opportunities that can impact a school district's path toward increasing the diversity of STEM teachers in the classroom, while preparing these same STEM teachers for science leadership opportunities. One identified need was a playbook of recommended discussions, practices, and tools that a school district could use to foster change. This playbook will provide school district decision makers and change makers with a starting point to begin their efforts. The playbook is designed to be responsive to district needs and will be revised as we collect feedback from school districts and individuals who offer best practices for success.

It is our sincere hope that those who find this playbook useful and/or those who have ideas to improve it will share those ideas with our team for inclusion. We also hope that collectively, we will foster the changes necessary to recruit, support, and retain a diverse pool of teachers in the STEM classroom, and engage them in science leadership opportunities that will leverage their unique perspectives. We want today's students to see a pathway forward for them – as STEM educators and STEM professionals, in a workforce that promises to be increasingly complex and technology-focused, now and in the future.

Sincerely,

Dr. Carol O'Donnell, Smithsonian Science Education Center

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Introduction

The Smithsonian Science Education Center in partnership with Shell Oil Company convened a group of leading education organizations in Washington, D.C. on September 19 – 20, 2016 to share and discuss proven strategies that have improved the recruitment, retention and promotion of a diverse STEM teaching workforce.

The ensuing rich exchange was made possible by the generous sponsorship of Shell Oil and their ongoing commitment to increasing the number of teachers of color in the STEM classroom while continuing to increase the opportunities for students in STEM in hope that tomorrow's workforce is highly skilled and capable of success in an increasingly STEM focused global economy.

Specifically, the meeting was designed to address the following goals related to increasing the diversity of the STEM teaching workforce:

1. Developing a playbook for school district-level systems change

2. Implementing school district-level systems change

3. Advancing leadership development

This publication ("The Playbook") addresses the first goal of the convening: Developing a playbook for district-level systems change. This Playbook captures some of the best practices for creating systems level change at the district level that have proven successful in increasing the recruitment, retention and promotion of a diverse STEM teaching workforce. The text is augmented with several district-level case studies for additional details on the identified strategies.

Chapter 1a

Why do we need a more diverse STEM teaching workforce?

1. All students benefit from a diverse teaching workforce.

2. Diversity in the teaching workforce brings authentic experiences to the curriculum and pedagogy that have shown success in addressing race/class achievement gaps.

3. Diverse teachers serve as role models for students who wish to pursue careers in the STEM fields.

4. Diversity in America's STEM teaching workforce can narrow the achievement gap. Read the report, Assessment of Diversity in America's Teaching Force (October 2004), (PDF, 512KB, 16 pages). http://www.nea.org/assets/docs/HE/diversityreport.pdf

> **Suzanne White-Brahmia & Etkina Eugenia reported that the students of color they worked with sometimes suffered from low confidence with regards to STEM and "impostor" syndrome, i.e., "everyone but me understands…" (2004, spring). Recruiting and retaining underrepresented populations. How we can help: The Rutgers Story. APS/AAPT Joint NY State Section Meeting.**

Chapter 1b

Why do we need systems change to increase the diversity of STEM teachers?

STEM education, and education at large, suffers from a disproportional underrepresentation of diverse people in teaching positions. Even though the majority of students in our education system are now from diverse communities, K-12 teachers are still overwhelmingly White.[1] Several theories support the need for increased representation of diverse STEM teachers, and teachers from diverse communities in general, in the classroom:[2]

*   Diverse teachers can serve as role models for students and increase their interest in and access to opportunities in STEM and teaching careers.

*   Students from diverse communities have higher academic outcomes and school experiences when they are taught by teachers from diverse backgrounds. "Cultural synchronicity" between diverse teachers and students helps drive improved academic outcomes and overall classroom experiences for both the teachers and students.[3]

With many national and state programs focusing on increasing the number of STEM teachers in the classroom and increasing the number of students choosing STEM in their career pathways, there is a significant untapped opportunity for these programs to have special focus on increasing the diversity of STEM teachers.[4]

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1. FSG research and analysis, 2015

2. *Diversifying the Teaching Force: An Examination of Major Arguments*, by Ana Maria Villegas and Jacqueline Jordan Irvine, The Urban Review, 2010; *The alarming effect of racial mismatch on teacher expectations*, 2015; FSG research and analysis, 2015

3. *Diversifying the Teaching Force,* 2010*; The alarming effect of racial mismatch on teacher expectations*, 2015; FSG research and analysis, 2015

4. FSG research and analysis, 2016

What is a 'systems approach,' and why is it the right way to approach this issue?

The limited diversity of STEM teachers is a complex problem: it is the result of a dynamic interplay of multiple factors and interactions between different, and equally complex, systems:[5]

- K12 education systems are not very effective at retaining diverse teachers and struggle to provide quality education and preparation to students from minority populations;
- Post-secondary education systems are not preparing and producing enough STEM teachers from diverse communities;
- Labor market conditions often make teaching STEM a less appealing career for younger professionals;
- Constantly changing demographics present additional and new challenges that affect all these systems.

What is a Systems Change approach?

In order to approach systems change, it is important to understand the idea of a 'system'. While there are many definitions, "interconnectedness" is a recurrent theme. New Philanthropy Capital defines systems as the following:

- *'A system is a configuration of interaction, interdependent parts that are connected through a web of relationships, forming a whole that is greater than the sum of its parts.'*
- *'A system is an interconnected and interdependent series of entities, where decisions and actions in one entity are consequential to other neighboring entities.'*
- *'Systems are overlapping, nested, and networked; they have subsystems and operate within broader systems.'*
- *'A system is a set of things— people, cells, molecules or whatever—interconnected in such a way that they produce their own patterns of behavior over time.'*

> *"In districts, we would be looking at a multi-year commitment of resources and human capital, and the assurance that they would support those teachers."*
>
> *- Teacher Prep Educator*

Key features of a system include:

- Systems are composed of multiple components of different types, both tangible and intangible. They include, for example, people, resources and services, as well as relationships, values, and perceptions.
- Systems exist in an environment, have boundaries, exhibit behaviors, and are made up of both interdependent and connected parts, causes and effects.
- Social systems are often complex and involve intractable problems.

Systemic change, defined by FSG's Srik Gopal & John Kania, is a fundamental change in policies, processes, relationships, and power structures, as well as deeply held values and norms.

Why are school districts the right entity for systems change?

Complex problems often require unique interventions, and not all programs can be reliably repeated with the same expected results.[6] School districts vary in size and composition but also have some similarities to learn from one another. Currently, there is no established comprehensive approach to recruiting, retaining, and promoting diverse teachers in STEM at the local or district level. Without a place-based focus, it is difficult to holistically address all the different factors that affect diversity of STEM teachers.[7] Systems approaches work best when the system has boundaries.

Place-based interventions provide geographic bounds to a system and the problem being affected.[8] Districts are geographically bounded by the neighborhood, city, state, and region in which these are located. Geographic bounds help identify and convene the relevant set of individuals and other sources of influence that are needed to affect change across the system.

- A place-based focus also allows the flexibility to adapt to the local context and focus on relationships and interdependencies within systems.
- Place-based approaches can elevate emerging and unique patterns specific to particular systems and places, as well as foster effective and robust identification and evaluation of outcomes.
- Because of the complexity of this problem, a place-based focus allows for targeted and emergent approaches to tackling the different pieces at play.

5. *Strategic Philanthropy for a Complex World*, by John Kania, Mark Kramer, and Patty Russell, FSG, 2014

6. *Strategic Philanthropy*, 2014

7. FSG research and analysis, 2015

8. *Evaluating Complexity*, by Hallie Preskill, Srikanth Gopal, Katelyn Mack, Joelle Cook, FSG, 2014

Chapter 2
Pre-conditions for district-level systems change[9]

What elements are needed to enable district-level systems-change to occur?

1. **Pre-service supports**
   - **Dedicated resources** for attracting and recruiting diverse STEM teachers (e.g., efforts within Schools of Education).
   - **Opportunities for pre-service** teachers to experience working in a classroom and early exposure to the cultural competencies needed to work with diverse student populations.

2. **In-service supports**
   - **Financial incentives** that encourage diverse STEM teachers to stay in the profession and thrive, for example:
     o Provide different pay structures, loan forgiveness programs, competitive compensation packages, supports to pursue advanced degrees in education.
     o Connect teachers to grant opportunities and scholarships to creatively maximize use of available resources.
   - **Support from key stakeholders**, for example:
     o **Local School Boards and school administrative** leadership who can influence policies.
     o **Tenured teachers from diverse communities** who are willing to serve as mentors for newer STEM teachers from diverse communities.
     o **Teacher unions, parent-teacher organizations, teacher leaders** who have a stake in seeing the school district succeed in making systems change.
   - **Open and comfortable work environments** for any individual, particularly individuals from diverse communities, to be able to bring their whole self, grow, and develop professionally and personally.
   - Policies that promote **professional development, leadership development, and mentorship** of diverse STEM teachers.
     o For example, **built-in time** (into contracts, academic-year calendars, etc.) dedicated to teachers' professional development; mentorship or leadership development will contribute to attracting and retaining diverse STEM teachers.

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9. Long, Cindy, "Raising Status of Profession Critical in Recruiting Teachers of Color," National Education Association (neaToday), 2015. Accessed at http://neatoday.org/2015/12/08/recruiting-teachers-of-color/; Partee, Glenda, "Retaining Teachers of Color in Our Public Schools: A Critical Need for Action," Center for American Progress, 2014. Accessed at https://www.americanprogress.org/issues/education/report/2014/06/28/91962/retaining-teachers-of-color-in-our-public-schools/; "Strategies for Retaining Diverse Personnel," State Consortium on Educator Effectiveness, 2014. Accessed at http://scee.groupsite.com/post/blog-2-on-new-hannover-report-strategies-for-retaining-diverse-personnel; FSG research and analysis, 2015; FSG Interviews

Chapter 3
Strategies for recruitment of diverse STEM teachers

Current context: What does research say about current recruitment practices for diverse STEM teachers?

National surveys have shown that a large number of diverse teachers enter the teaching profession via alternative preparation and certification programs, rather than through traditional, campus-based programs.[10]

While there has been an increase in diverse teachers over the last few years, this has not kept pace with the growth of students of color, who are now over 50% of all students in public schools.[11] However, in general, there are few recruitment strategies that are focused on improving the diversity of the STEM teacher pipeline.

While the overall percentage of 24-year-olds in the United States with STEM degrees is 6%,it is just 2.7% among African-Americans and 2.2% for Latinos.
(FSG research, 2016)

The number of educators of color has recovered in recent years from lows in the 1990s, rising to 17% in 2014. However, the growth of educators of color has not kept pace with the growth in students of color, who are now over 50% of all students.
(FSG research, 2016)

Strategy 1: Increase the number of diverse STEM teachers entering the profession via traditional preparation pathways

1. Teaching as a profession is not often perceived as a highly regarded or lucrative career option, which is contributing to fewer individuals entering the profession, particularly individuals from diverse communities in STEM.[12] For example, entry level salaries for engineers range from $55,000 (civil engineering)-$69,000 (computer and software engineering).[13] The average entry-level salary for a high school teacher is less than $40,000 per year.[14]

2. STEM professionals are often sought out by other competitive industries (e.g., technology industry). STEM professionals are actively recruited by these industries as companies strive to become more diverse themselves.[15] Typically, these private sector companies actively target STEM professionals from diverse backgrounds; the teaching profession does not have similar intentional messaging.[16]

3. Additionally, some people of color or people from diverse communities note that previous negative experiences with the education system serves as a disincentive to entering the teaching profession.[17] In fact, some professionals note that people of color are often discouraged from entering the teaching profession.[18]

4. Cultivating the desire to teach should start early. Evidence shows that young children form their ideas and goals about careers long before they enter the workforce. The way a district highlights its teachers' accomplishments, as well as elevates and rewards the profession is key to encouraging young people to enter the field.

"Culturally, we don't tell people to be teachers; we never say 'be a science teacher.' I think this is where we need to spend time—discussing how to make people value being a teacher."

-STEM professional

10. Klein, Rebecca, "A Majority of Students Entering School this Year are Minorities, But Most Teachers Are Still White," The Huffington Post, 2014. Accessed at http://www.huffingtonpost.com/2014/09/03/student-teacher-demographics_n_5738888.html; FSG research and analysis, 2015

11. Klein, "A Majority of Students Entering School this Year are Minorities," 2014; FSG research and analysis, 2015

12. FSG research and analysis, 2015

13. "2016 Engineering Salary Statistics," Michigan Tech College of Engineering. Accessed at http://www.mtu.edu/engineering/outreach/welcome/salary/

14. "Entry-Level High School Teacher Salary (United States)," PayScale. Accessed at http://www.payscale.com/research/US/Job=High_School_Teacher/Salary/a989e2c6/Entry-Level

15. FSG research and analysis, 2016; FSG Interviews

16. FSG research and analysis, 2016; FSG Interviews

17. "About Us," Teach Tomorrow in Oakland Website, Accessed at http://www.teachtomorrowinoakland.net/#!about-us

18. Teach Tomorrow in Oakland website - teachcalifornia.org/partners/details/287

What are the different ways this strategy can play out (e.g., what activities can a school district carry out)?

- Proactively conduct **outreach** to diverse groups of middle and high school students and college students to become educators.

- Create **networks of mentorship** to connect prospective teachers with diverse STEM teachers to share experiences.

- Help change the **narrative** around teaching in local communities, particularly among high school and young college students from diverse backgrounds.

- Create programs like a 'teaching assistant' program in middle schools and high schools in diverse communities where students assist teachers with younger students.

- Work with **universities and teacher preparation programs** in diverse communities to bolster and improve retention of potential teachers in these programs.

- Elevate teaching as a **legitimate and prestigious career** among all, but especially diverse, communities including people of color.

CASE STUDY

Teach Tomorrow in Oakland,[19] a program of the Oakland Unified School District, proactively asks people of color to become educators

About the program:

- Federally-funded initiative working to increase **local teachers of color** in Oakland Unified School District (OUSD)

Best-practice strategies:

- **School district conducts outreach to proactively** encourage people of color to become educators
- School district requires **5-year teaching commitments** to address educator turnover
- School district provides **mentorship networks** to connect teachers of color across OUSD

Results:

- School district has placed more than **150 teachers of color** in OUSD since 2009 (total count of teachers in Oakland is ~2100)
- OUSD **retained 78%** of placed Teach Tomorrow in Oakland teachers

Any district implementing these strategies can evaluate its success by measuring the following indicators:

- % of diverse students that participate in "grow your own" programs

- % of diverse students that pursue STEM teaching careers after participating in these programs

- Increased opportunities for diverse students to explore STEM and teaching career pathways in high school

- Define and showcase a sample career pathway to STEM teaching within the school district.

Strategy 2: Expand the recruitment pipeline to attract diverse STEM teachers from a variety of unique preparation pathways

What are the different ways this strategy can play out (e.g., what activities can a school district carry out)?[20]

- Develop "**grow your own**" programs to recruit and begin developing the interest of high school students from diverse communities to become educators.

- Partner with **community colleges** to create dual credit curricula for high school students from diverse backgrounds who are interested in teaching careers.

- **Partner with education programs** trying to expand teaching opportunities and increase the diversity of STEM teachers, such as local non-profits and community-based organizations (CBOs).

- **Refine policies** to become more amenable to recruiting diverse STEM teachers.

- Change **HR policies and processes** to integrate a stronger equity lens when hiring teaching staff.

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19. Teach Tomorrow in Oakland website - teachcalifornia.org/partners/details/287
20. Long, "Raising Status of Profession Critical in Recruiting Teachers of Color," 2015

CASE STUDY

Pathways2Teaching[21] in the Denver Metro Schools develops "grow your own" programs to increase access to education career opportunities for high school students

About the program:

• **"Grow your own"** program seeks to increase diversity of teachers in Denver metro schools

Best-practice strategies:

• School districts conduct outreach directly to **high school students** of color
• School districts partner with local colleges and universities to provide **dual credit teaching courses for high school students**
• School districts help develop curricula around **educational justice and learning**

Results:

• Graduates and current students are **~60% Latino/a and ~35% African American**

CASE STUDY

Teacher Cadets Program[22] in South Carolina supports early outreach efforts to youth interested in education through teaching career pathways

About the program:

• **"Grow your own"** early recruitment strategy used to identify potential teachers of color in local high schools

Best-practice strategies:

• School district creates a **teaching pathway** for high school students through **dual-enrollment** in education coursework at local colleges

CASE STUDY

The 3-D Coalition proactively engages and supports aspiring teachers of color throughout teacher preparation programs

About the program:

• **Coalition fosters partnerships** between Des Moines Public Schools, Drake University, and Des Moines Area Community College

Best-practice strategies:

• Schools target **aspiring teachers of color** in high schools and guides them through licensure programs
• Coalition provides **mentoring, capacity building, tuition support, and guaranteed employment** for program participants

Any district implementing these strategies can evaluate its success by measuring the following indicators:

• % of diverse students that participate in "grow your own" programs
• % of diverse students that pursue STEM teaching careers after participating in these programs
• Increased opportunities for diverse students to explore STEM and teaching career pathways in high school

21.   Pathways2Teaching website - pathways2teaching.com
22.   Teacher Cadets Program website - teachcadets.com

Chapter 4
Strategies for retention of diverse STEM teachers

Current context: What does research say about the issues that impact retention for diverse STEM teachers? [23]

While the rate of diversity among teachers has been increasing over the last several years, retention of diverse teachers continues to be an issue across the country. When diverse teachers enter the profession, they often find employment in hard-to-staff, underperforming schools, conditions that contribute to the low retention rates diverse teachers have within the profession. In particular, teachers from diverse communities often face:[24]

- **Limited opportunity** to voice concerns and limited ability to catalyze change in problem areas within their schools.
- **Lack of systems of support**, particularly from key leadership within schools/districts, lack of diverse mentors / role models / colleagues.
- **Lack of open environments** that foster communication, opportunities for giving and receiving feedback.
- **Poor school/district leadership**

Klopfenstein (2005) found a positive relationship between the percentage of Black math teachers in a school and the likelihood that a Black geometry student will enroll in a subsequent rigorous math course.

Klopfenstein, K. (2005). Beyond Test Scores: The Impact of Black Teacher Role Models on Rigorous Math Taking. Contemporary Economic Policy, 23, 3, 416-428.

Dee (2004) found that Black and White students' one-year assignment to a same race teacher significantly increased their math and reading achievement by roughly three to four percentile points.

Dee, T. S. (2004). Teachers, race, and student achievement in a randomized experiment. Review of Economics and Statistics, 86(1), 195-210.

Strategy 1: Develop, modify and increase retention efforts for diverse STEM teachers
What are the different ways this strategy can play out (e.g., what activities can a school district carry out)?

- Provide **customized professional development opportunities** that meet the unique needs of diverse STEM teachers working within individual school environments.
- Offer **opportunities for pre-service teachers** to participate in residency or shadowing programs with experienced, effective educators so that new teachers from diverse backgrounds have a clearer sense of what to expect and existing teachers from diverse backgrounds have the opportunity to exercise leadership.
- **Reform policies** that are amenable to retaining diverse STEM teachers. For example, create feedback opportunities for teachers to voice concerns and include teacher inputs in decision-making processes.
- Provide **compensation packages that are competitive** and attractive to all educators to ensure a diverse STEM teaching workforce. For example, onsite childcare, longer-term contracts, customized and dedicated paid PD time, flexibility for teachers to participate in master's and doctoral programs and still teach.
- Incorporate **cultural competency trainings in pre-service and in-service professional development** to enable educators, schools' staff and leadership to better understand the unique needs for diverse individuals.

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23. Klein, "A Majority of Students Entering School this Year are Minorities," 2014

24. "Strategies for Retaining Diverse Personnel," 2014; Partee, Glenda, "Retaining Teachers of Color in Our Public Schools." 2014; FSG research and analysis, 2016

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CASE STUDY

The Boston Teacher Residency[25] in Boston Public Schools aims to improve retention rates for educators by providing customized professional development support systems

About the program:

- **Residency program** focused on increasing teacher retention in Boston Public Schools (BPS)

Best practice strategies:

- Program incorporates **master's-level coursework** into residency program to reduce tuition costs for teaching residents
- Program provides customized and **ongoing in-house mentorship** opportunities

Results:

- Program has placed more than **184 teachers of color** since 2009
- BPS **retained 80%** of placed teachers from the Residency program

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Strategy 2: Create and provide systems that enable effective mentorship for retention

What are the different ways this strategy can play out (e.g., what activities can a school district carry out to enable teachers to thrive in the classroom)?

Provide and promote access to **diverse platforms** for mentorship and professional development opportunities, e.g.:

Teacher Networks

- **Association for Multicultural Science Education** hosts conferences for educators to convene and share best practices in STEM instruction.
- **National Alliance of Black School Educators** offers hands-on learning and professional development opportunities for Black educators.

Online Communities

- **American Association of Colleges for Teacher Education** provides online Topical Action Groups to share resources and develop ongoing support systems for diverse STEM teacher.
- *Playbook* creates a platform for dynamic dialogue between educators to share strategies for effective teaching and learning.

Specialized trainings

- **Exploratorium** hosts a Teacher Induction Program to equip new science educators with skills to facilitate effective teaching learning and leadership.[30]
- **Xavier University** hosts a Teacher Induction Program to equip new science educators with skills to facilitate effective teaching learning and leadership.[31]

Any district implementing these strategies can evaluate its success by measuring:

- % of diverse STEM teachers that stay at a school district for more than 2, 5, 10 years
- Level of participation among STEM faculty of color
- Increased retention rates for diverse STEM teachers at implementing district

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25.   Boston Teacher Residency website - bostonteacherresidency.org

26.   Association for Multicultural Science Education website - amsek16.org

27.   National Alliance of Black School Educators website - nabse.org

28.   American Association of Colleges for Teacher Education website - aacte.org

29.   Playbook website - playbook.panoramaed.com

30.   Exploratorium Teacher Institute website - exploratorium.edu

31.   Xavier University website - xavier.edu

Chapter 5: Strategies for promotion of diverse STEM teachers

Current context: What does research say about diverse STEM teachers in leadership positions?

While mentorship efforts (described in the previous section) aim to support and energize teachers within the classroom, leadership efforts (described in this section) are meant to empower teachers to exercise their leadership potential both within and outside the classroom. Schools districts that commit to increasing the diversity of STEM educators must work diligently to provide leadership opportunities within the school environment and the district environment. As seen within the STEM education field, the quality of a student's experience is enhanced when his/her educators are involved in leadership roles within both the education and the STEM fields. Accepting leadership positions often provides an educator with greater opportunity for professional development, for helping frame educational standards and teaching practices, and for expanding his/her network for knowledge, mentorship and the sharing of best practices.

Strategy 1: Create and provide opportunities for diverse STEM teachers to exercise leadership
What are the different ways this strategy can play out (e.g., what activities can a school district carry out)?

1. Identify opportunities to better support diverse STEM teachers in:
   - Exercising leadership within and outside the classroom (e.g., equipping teachers to serve as leaders among their peers, empowering teachers to have a voice in decision making).
   - Growing into the next level of their career (e.g., moving into specialized administrative roles, influencing industry policy).
2. Provide **resources and committed time** within academic calendars to enable teachers to engage in professional development opportunities (e.g., attend conferences) as well as mentorship opportunities.
3. Define the variety of leadership roles within a school and school district.
4. Define a pathway to leadership within the district.
5. Support leadership opportunities outside of the school district for educators (e.g., participating in state STEM education networks and professional development opportunities.

Strategy 2: Create and provide systems that enable effective mentorship for promotion
What are the different ways this strategy can play out (e.g., what activities can a school district carry out to enable teachers to be promoted in the profession)?

Teacher Networks

- **Teach for America** - Provides and promotes access to diverse platforms for leadership opportunities for teachers who teach in diverse communities.
- **Smithsonian Science Education Center** – Provides mentorship opportunities to teachers who participate in the LASER program either through serving as Faculty of the Strategic Planning Institutes or who serves on a district team.

Any district implementing these strategies can evaluate its success by measuring

- % of diverse STEM teachers who enter leadership positions
- Number of diverse STEM teachers preparing for or aspiring to leadership positions

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32. "509J Diveristy Action Plan," Corvallis Public School District, 2011. Accessed at
http://www.csd509j.net/Portals/1/Administration/Key%20Initiatives/Diversity%20Action%20Plan/Diversity%20Act ion%20Plan%20-%2006-11%20modified.pdf

Case Studies: Recruitment and Retention Programs to Increase Teacher Diversity

Introduction and Overview

In order to make progress on the issue of recruiting and retaining teachers where they are needed most, a systemic approach is needed. There are a number of states and districts that have undertaken successful approaches that should be replicated. Retaining teachers is a far larger problem than recruiting new ones— and a key to solving teacher shortages. The main problem is an exodus of new teachers from the profession, with more than 30% leaving within five years, and higher rates of turnover in lower-income schools. An additional problem is the flight of experienced teachers from less-affluent schools to more-affluent schools. This is strongly tied to working conditions – including administrative support and strong colleagues as well as tangible teaching conditions and salaries. Research also finds that teachers leave the profession much faster if they have less preparation before they enter and less mentoring support when they arrive. The costs of teacher attrition are very high – estimated at $15,000 on average per recruit who leaves, or at least $2 billion annually. These funds should be spent strategically on stronger teaching supports, rather than wasted on a fast spinning revolving door. Specific programs that have been successful in addressing these issues are described below.

The selected case studies focus on recruitment and retention processes and focus intensively on putting in place systems and processes that yield the highest quality teachers. Ideas from these detailed case studies can help personnel in school districts to think about ways to increase the effectiveness of their recruitment and retention efforts.

1. The Boston Teacher Residency (BTR)

Website: www.bostonteacherresidency.org

Year begun: 2003

Program Type: Fellowship

The Boston Teacher Residency (BTR) program recruits, prepares and retains highly diverse cohorts of teachers with the aim of helping to improve student learning in the Boston Public Schools. Created through a partnership between the Boston Public Schools and BPE (formerly the Boston Plan for Excellence), BTR addresses three major human capital challenges:

- Difficulty recruiting and retaining teachers for math, science, special education and English language learners;
- Difficulty recruiting and retaining minority teachers;
- A three-year turnover rate of 50 percent for new teachers.

BTR has worked toward overcoming these challenges. As a result, more than half of all BTR secondary teachers teach math or science. All BTR teachers are prepared to teach students with disabilities and English language learners; 40 percent of BTR graduates teach in one of these areas. Roughly half of all BTR graduates are people of color. Since the program's inception in 2003, 77 percent of all graduates placed in Boston public schools are still teaching in the district.

Program Model

Residents engage in 13 months of intensive practice-based coursework tightly integrated with a yearlong residency in a Boston school. Residents work in classrooms with a mentor teacher and teaching team for the full school year, taking on a set of roles and responsibilities designed to contribute to student learning. Mentor teachers are selected and trained by BPE. After successful completion of their residency year, participants become full-time teachers of record in Boston schools. Each graduating resident must commit to teach for at least three years in the Boston Public Schools. BTR graduates are in high demand; more than 90 percent have been hired by Boston schools, and 97 percent of principals say they would hire another BTR graduate. As teachers, they continue to receive induction support from BTR, including courses, study groups and classroom coaching. The organization also maintains an active alumni network to encourage continuing peer support.

Participants who successfully complete their training and residency receive a master's degree in education from the University of Massachusetts-Boston and a Massachusetts Initial Teacher License. During the residency year, they are provided with a modest stipend. At the beginning of the program, participants are loaned $10,000 toward program fees, with one-third of this loan forgiven for each year that they teach within the Boston Public Schools.

The Boston Teacher Residency program was one of three initial Urban Teacher Residency programs. Along with Chicago and Denver, the Boston program was created to provide the training, tools and support for new urban teachers that would help improve performance and reduce turnover. This partnership has since been expanded to become the Urban Teacher Residency United network, which today includes many programs around the country: the Academy for Urban School Leadership Chicago Teacher Residency; the Aspire Teacher Residency Program in Oakland and Los Angeles; the Atlanta Urban Teacher Residency; the Boettcher Teacher Residency in Denver, Durango and San Luis Valley; the Denver Teacher Residency; the Memphis Teacher Residency; the New Visions for Public Schools in New York City; the NYC Teaching Collaborative; the Philadelphia Teacher Residency; Project Inspire in Chattanooga, Tenn.; Project METRO in Milwaukee; the Richmond Teacher Residency in Richmond. Va.; the San Francisco Teacher Residency; the Seattle Teacher Residency; the Twin Cities Teacher Collaborative (TC2) STEM Urban Teacher Residency in Minneapolis and St. Paul; and the University of Chicago Urban Teacher Education Program in Chicago. Although these programs are all tailored to the specific needs of the districts in which they operate, they all share common principles and must meet quality standards and rubrics in terms of program vision; program management; recruitment and selection; mentor recruitment, selection and development; a residency year and a post-residency period; and participation in network-wide assessments and evaluations.

Results

More than 500 BTR graduates teach about 20,000 public school students every year.

The BTR program has been highly successful at retaining teachers in the Boston Public Schools teaching force. Some 80 percent of BTR teachers stay in the district for three or more years, compared with 63 percent of non- BTR teachers, and 75 percent of BTR teachers serve five or more years, compared with 51 percent of non-BTR teachers (Papay et al., 2011). Among minority teachers, 85 percent of BTR graduates stay three or more years, while 74 percent stay five or more years. BTR graduates are also 8 percentage points more likely to be Black and 4 percentage points more likely to be Latino than not-BTR teachers (Papay et al., 2011).

In addition, from 2003 to 2006, overall teacher retention rates past the first year of teaching increased from 71.8 percent to 85.4 percent, while those for minority teachers increased from 73.6 percent to 83 percent (Vom et al., 2009; Solomon, 2009).

Finally, BTR has also supported the replication and improvement of the teacher residency model to more than 20 sites nationwide through its partnership with Urban Teacher Residency United (see footnote 1 earlier), and has supported the launch of residency programs in India and Israel.

Sources

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Solomon, J. (2009). "The Boston Teacher Residency: District-based teacher education." *Journal of Teacher Education*, 60(5), 478-488. doi:10.1177/0022487109349915.

Horn, V, Salim, K., & Towery, I. D. (2009). *Hiring (and Keeping) Urban Teachers*. Boston, MA.

2. Call Me MISTER

Website: http://www.clemson.edu/hehd/departments/education/research/callmemister

Year begun: 2000

Program Type: University

The Call Me MISTER (Mentors Instructing Students toward Effective Role Models) Initiative (also called CMM) was established in South Carolina as a partnership between Clemson University and three historically Black institutions: Claflin University, Benedict College and Morris College. It was designed to increase the pool of Black male teachers available to work in South Carolina's schools, especially the lowest-performing elementary schools. The program has since expanded in both size and mission, being replicated by many more institutions within South Carolina, as well as Florida, Georgia, Kentucky, Mississippi, Pennsylvania and Virginia, with the aim of recruiting a broader, more diverse teaching force of both men and women from an array of minority groups.

Participants are recruited largely from among college students from underserved, socioeconomically disadvantaged and educationally at-risk communities. Participation in Call Me MISTER, however, is open to all, regardless of race, ethnicity or gender.

Results

Since 2000, when the program was established, at least 150 CMM graduates have been certified and secured teaching positions. As of March 2014, all program graduates remained in education careers. Some now work as principals or program directors. Another 164 teacher candidates were also enrolled at 7 different colleges and universities (WKKF, 2014). The program's current South Carolina partnership involves 20 schools: 14 four-year colleges and universities and 6 two-year technical colleges. Fall 2015 enrollment was 200.

Sources

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Call Me MISTER is building the next generation of African American male teachers," W.K. Kellogg Foundation War. 2014). Retrieved from http://www.wkkforg/what-we-do/featured-work/call-me-mister-is-building-theext- generation-of-african-american-male-teachers.

Hawkins, B. (Oct. 2010). "'Call Me MISTER initiative' succeeds in recruiting, developing Black teachers." *TheFfechinger Report*. Retrieved from http://hechingerreport.org/call-me-mister-initiative-succeeds-in-recruit-1g-developing-black-teachers.

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3. Grow Your Own Teacher

Website: http://www.growyourownteachers.org

Year begun: 2005

Program type: University/Consortium

The idea behind Grow Your Own Teachers (GYO) was conceived independently by two community groups working in Chicago around 1999. The Logan Square Neighborhood Association partnered with Chicago State University to help classroom aides and school paraprofessionals become certified teachers. At the same time Action Now realized that much of the teacher shortage in Chicago was due to retention problems, and began to work on initiatives to retain minority teachers.

In 2004, Illinois passed a state law to fund the GYO initiative and combine these two efforts. The goals of the program are to 1) create a pipeline of highly qualified minority teachers; 2) improve teacher retention in low-income schools; (3) recruit for hard to staff schools and hard to fill positions; and 4) increase cultural competence and community connections of teachers (Grow Your Own, 2012). The program was initially administered by the Illinois State Board of Education; in fiscal year 2011, it was transferred to the Illinois Board of Higher Education (IBHE). The funds received from the state are administered and distributed by IBHE. Grow Your Own Illinois is a separate nonprofit organization that coordinates the work across the state. There are currently 11 GYO consortia in Illinois, six of which are in Chicago. Each consortium consists of a community organization, a school district and a four-year college. Most also have community college partners.

Community organizations already working in neighborhoods recruit potential teachers for the program and provide leadership development training for participants, who work toward a full teaching certification at the university participating in the consortium. Funding support for the program provides loans to participants for their degrees that are forgivable after five years of teaching in a high-needs school or in a high-needs position. It also pays for child care, transportation and other necessities candidates may have to complete the program.

Candidates receive two years of mentoring support after they begin teaching. They also participate in professional development seminars with other members of their cohort during that time.

Program participants are typically nontraditional candidates. About 57 percent of candidates are between the ages of 30 and 50, 69 percent are employed full time outside of the program, and 66 percent have dependents. More than half of the candidates have family incomes below $30,000 annually. Fifty-two percent already work in schools in other capacities (e.g., as paraprofessionals), and 16 percent are parent volunteers (GYO Fact Sheet, 2013).

In line with GYO's mission, approximately 87 percent of candidates are minorities; 48 percent are Black and 34 percent are Latino (GYO Fact Sheet, 2013).

Results

As of August 2015, GYO had graduated 112 candidates, 72 percent of whom are teaching in low-income schools in Illinois. There are 166 candidates currently in the program, working on their certification, and the average GPA of candidates is 3.2 (GYO Fact Sheet, 2014).

A main strength of the program is the community base. The program serves as a catalyst to partnerships between communities, community organizations and institutions of higher education. Faculty at the universities develop relationships with schools in the community and are more likely to visit these schools or send other students to them for practicum experiences.

A major challenge reported by the program is similar to that of other programs that aim to attract and retain nontraditional minority students and to see them through to graduation. GYO reports that the academic hurdles common to students who have been out of the classroom for years (sometimes decades) and the inevitable struggles associated with balancing very full lives with a rigorous education program sometimes result in participants exiting the program.

Sources

Rasher, S. and Goold, R. (2012). *Grow Your Own Teachers: A Study of Effectiveness*. OER Associates.

GYO Fact Sheet. (2013). Grow Your Own Teachers: Chicago, IL.

GYO Fact Sheet. (2014). Grow Your Own Teachers: Chicago, IL.

GYO Illinois Test of Academic Proficiency Results. (2013). Grow Your Own Teachers: Chicago, IL.

4. Teacher Quality and Retention Program

Website: http://tmcf.org/our-programs/k-12-education/teacher-quality-retention-program

Year begun: 2009

Program Type: Fellowship

The Teacher Quality and Retention Program (TQRP) is a signature program of the Thurgood Marshall College Fund, a nonprofit organization that provides support to the nation's 47 publicly supported historically Black colleges and universities (HBCUs). TQRP is a competitive fellowship program with the goal of recruiting, supporting and retaining HBCU students and graduates who are ready to teach in underserved urban and rural communities. All education majors are welcome to apply, but the primary focus is candidates who are STEM (science, technology, engineering and mathematics) education majors, K-6 generalist education majors who are concentrating on a STEM subject, and HBCU male education majors. The program also recruits STEM majors interested in working as math and science teachers.

TQRP is a five-year, year-round professional development opportunity, which requires its fellows to:

- Participate in an intensive, all-expense-paid (plus stipend), two-week summer institute;

- Engage in interactive webinars throughout each school year; and

- Make progress on an individualized action plan that is co - designed with TQRP staff.

At the institute and beyond, fellows have opportunities to attend outside professional conferences, participate in additional virtual support, and obtain mentorship and teacher-leadership training. They also receive job-placement assistance via a recruitment fair during the summer institute.

Results

Using a pre - and post - assessment questionnaire for fellows in the 2014-15 cohort, there was a substantial increase in ratings from fellows in all six summer institutes except one, the new teachers institute at Texas Southern University (Armour-Thomas, 2014). To act on many of the recommendations in the 2014 -15 cohort, TQRP moved to a single institute model in the summer of 2015.

Since 2009, TQRP has graduated teachers who serve more than 1,500 students every year in urban and rural schools in at least 13 states, the District of Columbia and the U.S. Virgin Islands. of the 2014-15 cohort, which is the most recently studied in TQRP's annual external evaluation, 51 percent are Black males and 46 percent are in STEM fields. According to an internal survey conducted in late 2014, some 89 percent of former TQRP fellows indicated that they intended to remain in teaching, and 24 percent have become teachers of the year, content-area lead teachers, grade-level lead teachers, department chairpersons or school administrators. In addition, 42 percent of the 2014 -15 cohort who have bachelor's degrees are enrolled in advanced-degree programs (Feight Rowe, 2015).

TQRP provides targeted, research-based training on best practices before fellows enter the classroom, and then continues the support until after their third year as teachers of record. TQRP uses the expertise of such partners as the UTeach program at the University of Texas at Austin, the National Board for Professional Teaching Standards and the 100Kin10 national network, as well as current classroom teachers who serve as the program faculty and mentors. TQRP's success lies in its ability to guide fellows along the continuum from pre-service to novice to teacher leader, all with the ultimate goal of retaining these talented and dedicated individuals in the profession for the long term.

Sources

Armour-Thomas. E. "An evaluation of TMCF Teacher Quality and Retention Program's STEM summer institute."

23 Oct. 2014.

Thurgood Marshall College Fund (2015). "Teacher Quality & Retention Program: Overview." Retrieved from http://tmcforg/wp-content/uploads/2015/07/TMCF-TQRP-2015.pdf.

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5.   Teach Tomorrow in Oakland

Website: http://www.teachtomorrowinoakland.net

Year begun: 2008

Program Type: Alternate Route

Teach Tomorrow in Oakland (TTO) is a teacher recruitment and development program that aims to place teachers who reflect the diversity of the local student population. The program is the result of a grass-roots movement to diversify the Oakland Unified School District (OUSD) teaching workforce and a strategic partnership with former U.S. Rep. Ronald Dellums. The program recruits OUSD alumni, community members, middle and high school students, paraprofessionals, out-of-industry professionals and student teachers who value education, growth and educating Oakland youth. TTO provides educational and financial support for qualified TTO cohort members looking to successfully complete the California state credentialing requirements and commit to teaching within OUSD.

Participants attend qualified, accredited university programs from May to July for pre-service training and then attend an intensive six-week training before being placed as teacher interns in August. During their intern year, participants function as a teacher of record while taking classes to earn certification. TTO provides tutoring, professional development and classroom resources throughout the program.

Participants are often recruited from the communities in which the program hopes to place teachers. Funding comes from federal grants and district support. Participants make a five-year commitment to teach in Oakland or pay back the tuition assistance they received.

Results

As of fall 2013, TTO had placed a total of 112 teachers, 25 of whom left teaching, giving the program a retention rate of 78 percent. The program has retained an even higher percentage of minority teachers: 86 percent. According to one examination of the program, the five-year commitment may account for as much as 50 percent of the reason teachers remain in the classroom. Despite this high retention rate, structural challenges remain. In particular, minority teachers often report feeling isolated. TTO attempts to provide supports to combat this isolation. First, the cohort model creates a sense of shared experience and allows teachers to connect with each other. Second, senior TTO teachers lead monthly professional development sessions with newer cohort members, providing an opportunity for leadership development. Finally, TTO provides leadership sessions for teachers in their third through fifth years, in which teachers come together to share best practices and hold each other accountable (Rogers-Ard & Lynch, 2014).

Sources

Bireda, S. & Chait, R. (Nov. 2011), "Increasing Teacher Diversity Strategies to Improve the Teacher Workforce," Center for American Progress. Retrieved from http://cdn.americanprogress.org/wp-content/uploads/ issues/2011/11/pdf/chait_diversity.pdf.

 Rogers-Ard, R. & Lynch, K. M. (2014). "Teach Tomorrow in Oakland: History, Teacher Profiles, and Lessons Learned," Diversifying the Teacher Workforce: Preparing and Retaining Highly Effective Teachers, 32.

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6.   Today's Students Tomorrow's Teachers

Website: http://www.tstt.org

Year begun: 1994

Program Type: Eight-Year Teacher Pipeline

Today's Students Tomorrow's Teachers (TSTT) is a career development and mentoring program that recruits and trains culturally diverse, economically challenged high school students for college and a rewarding teaching career. TSTT was designed to address the growing shortage of teachers, particularly minority teachers. Upon receipt of teacher certification, TSTT participants pledge to return to the classroom as teachers and role models in their communities.

TSTT supports nearly 50 high schools and more than 800 students in four states (Connecticut, Massachusetts, New York and Virginia). More than 150 TSTT program graduates are now serving as teachers and role models in their communities. The makeup of those graduates is 47 percent Black, 4 percent Asian, 13 percent White, 32 percent Hispanic and 4 percent "other". Additionally, 24 percent of students were male, 90 percent received free or reduced-price lunch, and 75 percent were first-generation college students.

The program works with local school districts to identify potential participants.

TSTT partners with 25 colleges, which agree to forgive a portion of students' tuitions if they receive teacher certification. There is a bridge program that provides support when TSTT participants enter college. Sixty percent of students who participate in the TSTT program in high school attend partner colleges. In college, TSTT participants are partnered with a mentor, receive continuous counseling and remain connected with their home schools through internships and substitute teaching. Participants also receive teacher-preparation training at two full-day workshops with customized TSTT syllabi. TSTT also assists with the job search and placement process, including mock interviews.

Results

According to an independent evaluation released in 2010 (Cooper & Spielhagen, 2010), 102 students had completed the eight-year program and were teaching. Seventy-five percent of TSTT students in college had participated in the program for 4-6 years, indicating that students were successfully being recruited early on and being retained in the program. Respondents to a survey indicated that they found value in the mentoring and tutoring program, and gained confidence in their ability to be educators from these components. Also, 100 percent of respondents who had completed the program and were teaching reported that they are committed to remaining in the teaching profession.

TSTT reports that 70 percent of participants have received a college degree. According to data provided by the program, only 7 percent of TSTT teachers had left teaching by three years and 10 percent by five years.

TSTT is working on developing and implementing professional development trainings for participants who are currently teaching. It has also begun to offer professional development for mentors.

TSTT has also launched a Male Teacher of Color Initiative, which seeks to recruit a cohort of minority male students, particularly Black and Hispanic males, to consider the teaching profession.

 TSTT is in the early stages of conducting a longitudinal study to assess the program's impact on participants and the hundreds of thousands of students they teach, and is seeking to partner with national or regional research organizations to assist in this evaluation process.

Sources

Cooper, B. & Spielhagen, J. (2010). "Today's Students Tomorrow's Teachers: Program evaluation," Fordham University: New York, NY. Retrieved from: http://www.tstt.org/images/Program%20Evaluation_2010.pdf.

Perkins, B. H. (2003). "Today's students, tomorrow's teachers: A new regional collaborative precollegiate minority teacher recruitment model." Retrieved from http://fordham.bepress.com/dissertations/AAI3084914/.

7. Urban Teacher Enhancement Program

Website: http://www.uab.edu/education/cue/current-projects/urban-teacher-enhancement-program Year begun: 2004

Program Type: Tuition Support

The Urban Teacher Enhancement Program (UTEP) is a teacher preparation program designed to recruit, prepare and retain those interested in teaching in urban areas. It is an initiative of the University of Alabama at Birmingham (UAB) Center for Urban Education and is supported by grants from the U.S. Department of Education.

Developed and implemented in collaboration with local partner districts, UTEP actively recruits applicants among education students, second-career seekers and school paraprofessionals. Participating students receive tuition support for teacher-education coursework. Other features include coursework infused with competencies that have been validated as essential elements of urban teaching, coursework co-taught by university faculty and master teachers from the partner districts, enhanced field placements and mentorship from current and recently retired master teachers and administrators in the participating school districts and from UAB School of Education faculty liaisons.

Results

UTEP has a selective screening process. It only accepts candidates who are already accepted into the undergraduate teacher-education program at UAB or an alternate route or traditional master's degree program. According to reports, UTEP has been remarkably successful, with 90 percent of participants receiving state teacher certification (Hunt et al., 2012).

UTEP has a three-year teacher retention rate of approximately 70 percent; that is, the participants taught three or more years in a qualifying school or district. Roughly 70 percent of UTEP fellows are Black. In short, the program has helped to meet partner districts' need for minority teachers (Bireda & Chait, 2011). While UTEP's data indicate that the majority of participants remain in the classroom, a small but growing number of alumni are assuming leadership roles within schools, districts and learning-related entrepreneurial ventures.

Sources

Bireda, S. & Chait, R. (Nov. 2011), "Increasing Teacher Diversity Strategies to Improve the Teacher Workforce," Center for American Progress. Retrieved from http://cdn.americanprogress.org/wp-content/uploads/ issues/2011/11/pdf/chait_diversity.pdf.

Hunt, E. et al. (Oct. 2012). "Illinois Grow Your Own Teacher Education Initiative: 2011-2012 Policy and Program Recommendations." Retrieved from http://www.ibhe.org/Grants/PDF/GYO/GYO%20Annual%20Report_2012.pdf.

Other Districts' Approaches

8. Teachers as a Priority Program

The Teachers as a Priority Program, provides funding for improved working conditions in hard-to staff schools to attract and keep qualified teachers in these schools. The program supported class size reduction, curriculum reforms, mentoring, bonuses and other interventions to redistribute teachers. Studies find that teachers leave at much higher rates if they lack key elements of preparation. For example, teachers without student teaching experience or preparation in curriculum, teaching methods, learning, and child development.

9. Academy for Urban School Leadership

Website: http://auslchicago.org/

The Urban Teacher Residency designed in Chicago that has created new schools or completely re-staffed existing schools with highly expert mentor teachers and then placing mid-career recruits in the classrooms of these mentor teachers for a year while they complete coursework in curriculum, teaching, and learning at local universities. Rather than trying to teach without seeing good teaching in a sink or swim model, these recruits watch experts in action and are tutored into accomplished practice. These recruits receive a $30,000 salary during this year and a master's degree and credential at the end of the year. They are selected because they want to commit to a career in urban public school teaching and they pledge to spend at least four years in city schools. This model has already shown high retention rates in teaching and strong performance by graduates, who now staff other turnaround schools in the city.

10. Peer Assistance and Review Programs

Districts like Cincinnati, Columbus, and Toledo, Ohio, Rochester, New York, and Seattle, Washington have launched Peer Assistance and Review Programs, which have sharply reduced attrition rates of beginning teachers by providing expert mentor teachers with release time to coach beginners in their first year on the job and evaluate them at the end of the year. Each program was established through collective bargaining and is governed by a panel of teachers and administrators. The governing panel selects consulting teachers through a rigorous evaluation process that looks for teaching skills and mentoring abilities. These mentors, or consulting teachers, work in the same subject area as those that they are assisting. They visit, observe, and consult with the beginning teachers at least weekly, and they meet regularly with one another to develop their skills as mentors and to share resources and ideas. In all of these districts, beginning teacher attrition has fallen as a result of this program: In each case, first year teachers leave at rates of no more than 5 percent – most because they have been discontinued through the evaluation process rather than because have become discouraged. Some of the districts previously experienced beginning teacher attrition rates as high as 30 percent or more.

The additional benefit of these and other mentoring programs is the new lease on life for many veteran teachers as well. Expert veterans need ongoing challenges to remain stimulated and excited about staying in the profession. Many say that mentoring and coaching other teachers creates an incentive for them to remain in teaching as they gain from both learning from and sharing with other colleagues.

11. Beginning Teacher Support and Assessment

Website: http://www.btsa.ca.gov/

On the state level, induction programs that are tied to high quality preparation can be doubly effective. California's Beginning Teacher Support and Assessment (BTSA) Program, which provides mentors and other supports for beginning teachers in their first two years, has shown that carefully designed mentoring systems can produce rates of beginning teacher retention exceeding 90% in the first several years of teaching. The state provides $3000-$4000 in matching funds per beginning teacher to support this program.

Recruitment Drives and Incentives

The highly selective North Carolina Teaching Fellows program, for example, paid all college costs, including an enhanced and fully funded teacher education program, for thousands of high-ability students in return for several years of teaching. After seven years, retention rates for these teachers exceeded 75%, with many of the remaining alumni holding public school leadership posts (NCTAF, 1996).

North Carolina launched a mentoring program

For existing teachers, North Carolina created professional development academies, a North Carolina Center for the Advancement of Teaching, and teacher development networks such as the National Writing Project and analogous institutes in mathematics. This was in addition to its incentives for National Board Certification. Connecticut, among other things, required continuing professional development, including a master's degree for a professional license. After Connecticut's $300 million 1986 initiative, for instance, the higher salaries and improved pay equity combined with the tougher preparation and licensing standards and an end to emergency hiring, swiftly raised teacher quality. "When there is a teaching opening in a Connecticut elementary school, there are often several hundred applicants" (p. 28).

Both states sought to increase not only salaries and the quality of preparation for teachers, but also the incentive structure for distributing teachers to fields and locations.

District success stories reflect the importance of recruiting, inducting and supporting qualified teachers using policy tools available at the local level and leveraging state assistance. Following are four examples of what urban districts have done.

New York City Case

New York City illustrates how a focus on recruiting qualified teachers, coupled with necessary salary increases, can have a large effect in a brief period. The state, however, pressured the city to hire qualified teachers and mandated that uncertified teachers could no longer teach in low-performing schools. The district focused on more aggressive recruiting and hiring of qualified teachers and implemented a steep increase in 14 salaries—averaging 16% overall and more than 20% for beginning teachers—to make them more competitive with surrounding suburban districts. With these policies, 2002- 2003 vacancies were filled by July, and 90% of new hires were certified, up from 60% the year before. The remaining 10% were in programs that would lead to certification by the end of the school year (Hays & Gendar, 2002).

Sweeping changes stressed continuing professional development for teachers and principals, coupled with a relentless concentration on instructional improvement. Meanwhile, the central office carefully managed the recruitment, hiring and placement of new teachers and principals. It ended the hiring of unprepared teachers and sought recruits from several leading teacher education programs in the city, forging partnerships for student teaching and professional development with these institutions as well. Similar programs for developing principals were launched. The district's growing reputation for quality also attracted other teachers. Its strategies, rather, involved recruiting aggressively, creating university partnerships to develop a pipeline of well-prepared teachers, and supporting teachers with strong mentoring and professional development.

New Haven Case

New Haven, California. California success stories are particularly notable because that state in recent years has ranked first in the nation in the number of unqualified teachers. In this high-demand context, with state policies that were, until recently, relatively unsupportive (e.g., low expenditures, lack of reciprocity with other states, restricted teacher education options), some districts have nonetheless achieved significant staffing improvements. New Haven Unified School District, just south of Oakland in Union City, which enrolls 14,000 mostly low-income and minority students, is one that has succeeded while neighboring districts have not. New Haven combined high salaries, aggressive recruiting and close mentoring with a high-quality training program worked out with area universities. Although not a top-spending district, it invested its resources in teacher salaries and good teaching conditions. In 1998, for example, New Haven's salaries were more than 30% higher than nearby Oakland's, where large numbers of unqualified teachers were hired, even though New Haven's per pupil spending was below Oakland's (Snyder, 2002).

New Haven uses advanced technology and a wide range of teacher supports to recruit from a national pool of exceptional teachers and to hire them quickly. The district was one of California's first to implement a Beginning Teacher Support and Assessment Program that assists teachers in their first two years in the classroom; all beginning teachers get help from a trained mentor, who is given release time for the purpose. In addition, New Haven collaborated with California State University-Hayward on the right kind of alternative-certification program, combining college coursework and an internship, including student teaching, conducted under the close supervision of university- and school-based educators. As a result of these initiatives, the district has a teacher surplus in the midst of general shortages.

San Diego Case

San Diego, California. Using similar strategies, San Diego City Schools recently overhauled its teacher recruitment and retention system, aggressively recruiting well trained teachers, collaborating with universities on new training programs in high-need fields, and creating smooth pathways with local schools of education. It offers contracts to well-prepared teachers as early as possible (sometimes as much as a year in advance of hiring) and reaches out to teachers in other states. In addition, the district streamlined the hiring process, putting the entire system online, improving its capacity to manage hiring data, vacancy postings and interviews that had slowed the process and caused many candidates to give up and go elsewhere. But San Diego filled almost all of its 1,081 vacancies with credentialed teachers, eliminating all but 11 of the hundreds of previously hired emergency permit teachers who had been assigned largely to high minority, low-income schools.

DISCUSSION QUESTIONS

We hope that reading the case studies above will trigger dialogue and discussion about 1) how the practices accentuated might look in your own district, 2) what measures you have in place to assess the success of your recruiting and retention strategies and 3) what messages are you communicating to potential teacher candidates.

References:

Albert Shanker Institute: The State of Teacher Diversity

Recruiting and Retaining Teachers: What Matters Most and What Can Government Do? Linda Darling-Hammond Charles E. Ducommun Professor, Stanford University

http://www.forumforeducation.org/news/recruiting-and-retaining-teachers-what-matters-most-and-what-can-government-do

Steps for Creating a District Action Plan

I. **Awareness** – I can investigate the concern. *Justify with data.*

- Make an open records request asking specifically for the number of science teachers in the school district according to campus name and ethnicity.
- Utilize the school/campus report card to determine the student population and identified subpopulations.

II. **Advisement** – I can share that there is a concern in regard to disproportionality based on the data obtained in the Awareness phase.

- Team up with local advocacy groups to share the data in the community.
- Attend and share the data at school board meetings, town hall meetings, Superintendent forums, PTO/PTA meetings, and other venues structured to hear concerns from the community.
- Share campus data with the campus principal and leadership team.
- Write an editorial in the local newspaper.
- Work with and support the district's science coordinator.

III. **Action** – I can take action to address the concern.

- Express the concern in writing to the Superintendent.
- Schedule a meeting with the Superintendent.
- Volunteer and run to sit on district and campus decision making committees such as the school board and campus-based leadership teams that work on the district and campus improvement plans.
- Request that the district Human Resource department seek opportunities to partner with local pre-service programs targeting minority science educators based on the district's subpopulation data
- Request that the Human Resource department recruit purposefully at minority colleges and universities.

IV. **Accountability** – I can monitor progress on addressing the concern.

- Make annual open records request asking specifically for the number of science teachers in the school district according to campus name and ethnicity.
- Remain updated with the district's hiring practices.
- Prepare an annual update to share progress at a school board meeting or other local forums of interest.

Additional Resources on Teacher Diversity and STEM

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