EDC Education Development Center

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ISSUE BRIEF

Expanding Access to Data Science Careers

Panel 3: Enhanced Strategies to Increase Diversity

Executive Summary. Massachusetts is rightfully proud of its innovation economy, particularly in the life sciences, where amazing breakthroughs happen every day. To remain on the leading edge of discovery, it is key for the Commonwealth to ensure its life sciences and data science workforces represent the full diversity of its citizens. Yet in Massachusetts and nationwide, people from low-income communities, women, people with disabilities, Black people, Latinx/Hispanic people, and Native American people are underrepresented in life sciences and data science careers. This speaks to the need to ensure all youth and adults can access education, apprenticeship, mentoring, and training opportunities that provide pathways to entering and advancing in these careers. Expanding access to these opportunities is the equitable and just thing to do. It is also essential to addressing acute workforce shortages in these fields and ensuring a strong innovation economy.

In this brief, we share highlights from the third in a series of online panels co-led by Education Development Center, the Massachusetts Life Sciences Center, and the Massachusetts Biotechnology Education Foundation. During the panel, four experts with deep experience in diversity and inclusion strategies, education, and workforce development addressed challenges and strategies to expanding access to data science careers. While exciting programs are underway in the Commonwealth, the panel reached consensus that policy change and financial investment will be key to expanding access to data science careers.

Key Takeaways:

How Can We Raise All Students' Awareness of Exciting Opportunities in Data Science?

- **Make data science relevant.** Help students realize that data science is part of their daily lives. It's in sports, in the headlines, and all around them wherever they go and whatever they do. Share engaging, simple messages to plant seeds of interest that students can water and grow in and beyond college.
- **Connect with data scientists**. Introduce students to data scientists who can serve as role models, especially people who look like them and are from their communities, so they can say "I can do that, too!" This includes building on programs such as Massachusetts Life Sciences Center's internships and apprenticeships and Bunker Hill Community College's STEM Starter Academy.
- **Start with something personal.** Have students explore highly relatable data that spotlights the importance of data science. For example, begin by studying medical data and teaching students about their health and the health of their communities. This can be particularly powerful for students of color in communities with significant health disparities.
- **Start early.** Young children in Head Start programs and preschools are curious, full of questions, and ready to dive into hands-on science and engineering explorations. Weave developmentally appropriate data science learning into those early explorations.
- **Explain the power of data.** Data is used to justify who gets loans and mortgages, who is eligible to receive certain medicines and medical procedures, and much more. It's vital for women and underrepresented people to be at the table to interpret data and make decisions and policies.

What Academic Supports Are Most Important For Sustaining Student Engagement and Success in Data Science?

- **Address systemic racism and stereotype threat.** Mathematics is a focal point of inequity. Our country's approaches to teaching math, and our perceptions of "who can do math," have negatively impacted generations of students who are Black, Latinx, female, and from low-income communities. The persistent attitude that "If you are from a poor community, you can't do math, you can't be a scientist" is pervasive and powerful.
- **Promote cultural responsiveness.** Student success starts from the roots of how we are creating a pipeline of educators. Students need to have teachers who believe in their ability and help them see their potential. We can prepare all teachers to make data science instruction culturally responsive, culturally relevant, and culturally appreciative.
- **Share historical role models.** Tell the histories of mathematicians and data scientists who are Black, female, Latinx/Hispanic, Native American, and who have disabilities.
- **Weave data science instruction in across the curriculum.** Sustain engagement and interest by bringing data science out of the lab. For example, if you teach your class about the work of the journalist and activist Ida B. Wells, you could also examine her work as a researcher and discuss the data about lynchings she gathered and analyzed.
- **Broaden students' horizons.** Many students can't see the full range of career pathways that are available to them, and their families may not be aware of the all potential careers. Guidance counselors and teachers can play a vital role in helping students and families see the full range of possibilities.

How Can We Help Students See Their Ability to Succeed In Pursuing Pathways to Data Science Careers?

- **Invest in supporting students' success.** We can create programs and systems that will provide all students with equitable access to high-quality, highly relevant data science learning. An important step is increasing seed funding to launch and sustain high school and college programs that prepare students to be successful in new STEM careers, including in data science and the life sciences.
- **Create and connect multiple pathways.** One promising strategy is to provide clear and intersecting routes to pursue data science careers and not just one pathway. A growing number of middle schools offer data literacy as an engaging introductory course. High schools are starting to provide data science courses and support students in working with large, public data sets. Community college apprenticeships, internships, and certificate programs give students a glimmer of what it's like. To sustain learning, we will need to connect community colleges and four-year institutes of higher education to create inexpensive and varied ways for students to enter and succeed in four-year programs and pursue master's degrees in data science.
- **Engage communities.** Involve students' communities in helping them see how their knowledge of data science will benefit their communities. Work to support family and community data science literacy. Promote data science ambassadors in communities to interest, engage, and encourage students to take part in citizen data science focused on real-life issues that affect people in low-income communities and communities of color. Take the conversation about data science to bodegas, barbershops, and churches.

What Wrap-Around Services and Other Supports Do Students Need to Successfully Pursue Data Science Careers?

- **Question status quo and champion change.** We need data science champions to challenge and change systems that have led to the current lack of diversity in the data science workforce. Until we have widespread recognition from industry that diversity and innovation are inextricably linked, it will be very difficult to ensure that all students can successfully pursue data science careers.
- **Promote job shadowing and networking.** In addition to supports such as mentoring programs, apprenticeships, and internships, students benefit from job shadowing and networking. Job shadowing gives students the chance to observe data scientists in action, experience the environment in which data scientists work, and ask lots of questions. "Knowing someone" and networking is invaluable for all careers. Yet it is especially key in helping open doors to data science opportunities for students from groups that have historically been, and are currently, underrepresented in data science careers.
- **Advocate for policy change.** A wave of policy reform will be needed to successfully expand and diversify the data science workforce. One promising policy change would be to strengthen and expand Title IX to institute innovative technological education within all of our schools in order to reach all of our students. This might include mandating enhanced training for teachers in highly technical areas, such as data science.

Conclusion

The third panel in the 4-part series discussed the roles that institutional racism, inequitable access to data science education, and not "seeing yourself in data science" play in reducing the diversity of the data science workforce. Although promising programs are working to address these issues, panelists concurred that greater investments, stronger systems, and new policies will be needed for these models to take root, grow, and succeed in expanding and diversifying the data science and life sciences workforce in the Commonwealth. The following implications arose from the discussion:

- Both education and industry leaders have key roles to play in expanding access to data science careers. It could be beneficial to convene the two groups to set an agenda to advance systemic change to address persistent and pervasive discrimination in education and employment.
- As the field of data science continues to rapidly grow and evolve, investing in education, connecting programs, paving multiple pathways, and creating new policies are all key to ensuring equitable access to data science careers and creating a robust, well-trained workforce.
- To diversify the data science workforce, it is vital to proactively spark young people's interest in data. There is the opportunity to launch a data science campaign to help young people to "See themselves in data science" and to clarify pathways to data science careers.
- Much like citizen science efforts, community-based data science initiatives and "community data science ambassadors" hold the potential to engage young people's interest in data science. Such initiatives could help illuminate the relevance of data science to students' daily lives and to the people they care about.

Panelists

A special thank you to our moderator and distinguished panelists for their insightful contributions to the discussion and their dedication to improving the quality and equity of education.

- **Brenda Darden Wilkerson**, President and CEO, AnitaB.org
- **Pam Eddinger**, President, Bunker Hill Community College
- **Ginette Saimprevil**, Executive Director, Bottom Line-Massachusetts
- **Ron Walker**, Executive Director, Coalition of Schools Educating Boys of Color (COSEBOC)
- *Moderator:* **Kenneth Turner**, President and CEO, Massachusetts Life Sciences Center

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