Advancing Equity through Data-driven Collective Action: A Biogen STAR Case Study
April 14th, 2023, 10:30am
Welcome & Introductions
About Root Cause

WHO WE ARE
Root Cause is a nonprofit consulting team that helps drive transformative social change. Our mission is to be a transformative partner in building, improving, and sustaining social change initiatives that enable all people to thrive. We help nonprofits, public agencies, and philanthropies achieve their goals while advancing racial equity and justice.

WHAT WE DO
We’ve helped over 400 partners strengthen their
1) Strategy, design, & implementation,
2) Collective Action and
3) Continuous learning & improvement
On today’s panel...

Sonja Okun
Principal
Root Cause

Khari Milner
Co-Director,
Cambridge Agenda for Children
Cambridge Public Schools

Robert Emery
Data Manager– Biogen STAR Initiative
Cambridge Public Schools

Sarah Jo Torgrimson, PhD
Biogen Data & Evaluation Specialist
Somerville Public Schools
Introduction to STAR
Origins of STAR: Strengthening & diversifying the future STEM workforce

Employment in STEM fields is projected to continue growing:

- Between 2020 and 2030 → 10.7 million additional STEM jobs in the US (+10.5%)
- In MA → STEM jobs will account for 40% of total employment growth through 2028

Yet... students from traditionally underrepresented communities are disproportionately unexposed to and unprepared for STEM careers.

- Black (40%) and Latino (37%) students drop STEM majors before earning a degree vs. 29% of white STEM students.
- Cambridge, MA → 33% of Black 8th graders and 15% of Latinx 8th graders are meeting expectations in math vs. 53% of White and 56% of Asian peers.
- Somerville, MA → 31% of Black and 12% of Latinx 8th graders are meeting expectations in math vs. 56% of white and 77% of Asian peers.

The Biogen Foundation’s STAR (Science, Teacher support, Access & Readiness) Initiative is a $12 million, five-year investment that addresses disparities in STEM pathways by bringing together several high-performing nonprofits and two school districts in a coordinated network to serve students grades 6-14 who have been historically underrepresented in STEM college and career pathways, including students of color, economically disadvantaged students and English language learners.
STAR’s Collective Action

Funder                   Network Design & Facilitation

Biogen Foundation

Founding STAR Grantees

Breakthrough Greater Boston
Citizen Schools
Lesley University

School District Partners

Cambridge Public Schools
SOMERVILLE Public Schools
The Biogen Foundation has made a visionary commitment through STAR. There is no better place poised to lead the way in building a strong local STEM education ecosystem than the Greater Boston area, home to Kendall Square—one of the world’s most powerful life sciences and technology hubs.
Key components of STAR

One of the most important and unique aspects of the STAR collective action initiative is the engagement of both school districts in the network. STAR liaisons from each grantee organization, and each school district, have met monthly and worked collaboratively for over three years with the shared goal of advancing STEM education equity.

The myriad challenges the pandemic has posed for students and families has highlighted the critical role that out-of-school time organizations play in leveling the playing field for students who typically do not have equal access to STEM exposure and enrichment opportunities.
Assessing STAR’s impact
Assessing STAR’s impact

Biogen Foundation’s investment in supporting STAR Data Specialist positions in each school district is helping to optimize the work of grantee organizations and schools by analyzing STAR’s impact.

The alignment of data collection and analysis between STAR and the school districts STAR serves helps organizations better understand:

- **Who they serve**
- **How students experience STEM education** in middle + high school
- **How STAR as a network can strengthen individual and collective practices to help more students** specifically students of color, low-income students, and English language learners - become better prepared to pursue STEM education and career pathways.
STAR Data Snapshots
Benefits of a district-embedded data position

Analyses

- Economically Disadvantaged
  - State: 50%
  - Cambridge: 40% (+9%)
  - Black: 50%
- Non-Profit Grantees' Priorities
  - Somerville: 42% (+14%)

Graph showing: 86% in 2019, 86% in 2020, 81% in 2021, 87% in 2022
Progression of data specialists’ work

Who are we serving?

Visualizing progress

Analyzing impact
Dynamic dashboards to tell STAR's story

Check out STAR's Public Dashboard:

tinyurl.com/5b7pwrtx
How do we assess STAR Initiative goals?

What do we want to capture?

STEM Achievement

How is STEM achievement assessed?

MCAS

- Math Growth
- Math Scaled Score
- Science Scaled Score (8th Only)
- Percent Possible Points Math
- Percent Possible Points Science (8th)

Course Grades

- Letter Grade Math
- Letter Grade Science
- Probability of Passing Math
- Probability of Passing Science

How is proficiency on assessments quantified?

Covariates
How do we assess STAR Initiative goals?

What else may explain differences in performance?
Our Analysis Process

<table>
<thead>
<tr>
<th></th>
<th>STAR Students</th>
<th>Non STAR Students</th>
</tr>
</thead>
<tbody>
<tr>
<td>9th Grade STEM Passing Rate</td>
<td>86%</td>
<td>80%</td>
</tr>
<tr>
<td>Black, Latinx and/or Students from Low Income Households</td>
<td></td>
<td></td>
</tr>
<tr>
<td>HONORS STEM ENROLLMENT</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Black Students</td>
<td>52%</td>
<td>45%</td>
</tr>
<tr>
<td>Students from Low Income Households</td>
<td>47%</td>
<td>42%</td>
</tr>
</tbody>
</table>

Black Students = Black, Latinx and/or Student from Low Income Households
Logistical challenges to data work

District differences with:
- Course progression
- STAR partners serve districts differently
- Dashboard software

Longitudinal factors:
- Access to data on student majors in college
- Access to job/career information
What’s next…

STEM Motivation

- Autonomy
  - Confidence in STEM Abilities
  - STEM Career Exploration
  - STEM Course Enrollment
  - STEM College Major

- Interest

- Competency

- Belonging
  - Feelings of Belonging in STEM Spaces
  - Personal and Social Identities
  - Academic and Career Goals

Covariates

Past Experiences with STEM

- Previous Academic “Tracks”
- Participation in Programs or Activities
- Failures and Successes
- Comfort in STEM Spaces and/or Discrimination

Social and Cultural Expectations

Presented with XMind
What Data Specialists add to their Districts

Sarah Jo Torgrimson  
*Biogen Data & Evaluation Specialist*  
Somerville Public Schools

- Contributes to district evaluation and research projects, analyzing quantitative and qualitative data.
- Consultant for data infrastructures around classroom, school, and district level metrics.
- Develops data dashboards, infographics, and presentations to improve district data literacy and provide educators and leaders with accessible, interpretable, and actionable data.

Robert Emery  
*Data Manager- Biogen STAR Initiative*  
Cambridge Public Schools

- Designs and builds the infrastructure for data to flow from its source to dashboards including district Out-of-School-Time data and COVID data.
- Documenting internal data structures
- Building automated reports and ad hoc internal reports
Panel Discussion
1. Can you talk about how the work the STAR Data Specialists are doing is helping to overcome some of the typical barriers to sharing data?

   a. **CPS**: You were already working on ways to address access and equity for students in terms of access to OST supports. Can you talk about the function of Agenda for Children, CPS, OST STEM providers and the development of the Community Partner Portal?
   
   b. **SPS**: Can you speak to how your roles and work you’ve done to create data dashboards has helped increase capacity in this area for your district?

2. CPS: How has working in this collective action initiative, particularly now with these data roles, helped strengthen relationships between OST programs/partner orgs and your districts?

3. SPS: The “T” in STAR stands for Teacher support. One of the grantees in STAR is Lesley University which addresses this important aspect of the work to strengthen STEM education equity. Since Lesley’s work isn’t captured in most of the data about students, can you speak briefly about how their work has increased capacity in your district (towards this goal)?
Audience Q&A
Thank you for joining!
Contact us at:
sokun@rootcause.org
jhennick@rootcause.org

Follow this code for more STAR Resources!

A Biogen Foundation Initiative
Percent of Black, Latinx, or Low Income Freshmen who Passed All STEM Courses
Our Analysis Process

- Black, Latinx and/or Student from Low Income Households
- All Other Students

**STAR Students**

- 9th Grade STEM Passing Rate
  - Black, Latinx and/or Students from Low Income Households: 86%
  - Non STAR Students: 80%

**Non STAR Students**

- HONORS STEM ENROLLMENT
  - Black Students: 52%
  - Students from Low Income Households: 47%