Annual Impact Report

THE GREATER BOSTON STEM PROGRAM

2023-2024

In These Pages

A Thank You

Dear Friends and Supporters,

We are delighted to present the Impact Report for the Greater Boston STEM Program (gbSTEM) for the 2023-2024 school year. This year has been one of significant growth and meaningful achievements, and it is with great pride that we share some of the progress and the impact that we have made together this year. With your help, we have continued to thrive and make a difference for students throughout Greater Boston.

In today's rapidly advancing world, fields in STEM (Science, Technology, Engineering, and Mathematics) have become crucial drivers of innovation and economic success. At gbSTEM, we are dedicated to bringing access to free, quality STEM education to every learner who needs it. By offering free classes online and in-person, we ensure that all of our students, regardless of economic background or status, have equal access to enriching educational opportunities.

We emphasize hands-on learning, and our students have all the more to show for it, building impressive independent final projects every semester. We have an unwavering commitment to the quality of our education. With the support of our community and the commitment of our active and dedicated network of hundreds of volunteer instructors, we are able to offer impactful learning opportunities in dedicated small-group environments.

Just this year, we have reached over 1000 students from 57 towns and 124 schools, growing our program by 160% since the 2022-2023 year. This year we offered 17 courses in various math, science, engineering, and computer science topics, running a total of 110 classes and 21 various STEM events.

In our instructor program, this year, we engaged 214 dedicated high school volunteers in meaningful teaching work, providing them with valuable experience that facilitates the responsibility and leadership beneficial in future job opportunities.

We are grateful for the wonderful response we continue to receive from students, parents, and our volunteers. We would like to thank the community organizers and partners that have helped gbSTEM flourish, especially the Cambridge Public Library, which has graciously allowed us to hold our in-person classes at their location.

As we look to the future, we are committed to furthering our impact by **Expanding Reach, Enhancing Programs,** and **Increasing Community Engagement.** We plan to introduce a competitive robotics course for our middle school students, establish summer workshops, and initiate a training program for our student-to-instructor pipeline.

We are proud of the progress made during this report period and are committed to continuing to work towards our mission. Our achievements are a testament to the dedication and generosity of our community of donors, volunteers, and partners. Together, we can achieve even greater impact in the future.

Thank you for your continued support!

Sincerely,
Kendree Chen, Michael Bolgov, and Dea Pance
Presidents, The Greater Boston STEM Program
July 14, 2024

Introduction

Diversity in STEM has a long way to go.

In today's rapidly advancing world, fields in STEM (Science, Technology, Engineering, and Mathematics) have become crucial drivers of innovation and economic success.

However, statistics reveal a stark reality: minority and low-income students are significantly underrepresented in STEM fields. According to recent studies, African Americans, Hispanics, and Native Americans combined make up only 13% of the STEM workforce, despite constituting 30% of the U.S. population (NSF, 2023). Similarly, women, particularly from minority and low-income backgrounds, are vastly underrepresented in STEM careers, accounting for only 28% of the workforce (NSF, 2023).

Students from underserved communities face multifaceted challenges that hinder their growth and success in STEM fields:

- **Limited Educational Resources:** Schools in low-income areas often lack funding for updated technology, laboratory equipment, and qualified STEM educators. This disparity in resources creates an uneven playing field, where students from affluent districts have access to advanced coursework and extracurricular STEM activities, while their counterparts struggle with basic learning materials (US Department of Education, 2021).
- **Quality of Teaching:** High teacher turnover rates and shortages of qualified STEM instructors in underserved schools further impede educational quality. Without consistent, experienced educators, students may lack mentorship and guidance critical for fostering interest and proficiency in STEM subjects (Education Trust, 2022).
- **Community Support and Exposure:** Many underserved students lack exposure to STEM mentors and career opportunities within their communities. This absence of visible pathways to success in STEM fields can deter students from pursuing these disciplines, reinforcing the cycle of underrepresentation (Education Week, 2023).

A Community Solution

1

Providing Quality Education

At gbSTEM, we actively engage the talents of passionate high school volunteers by employing them as instructors and curriculum developers. Each year, our dedicated curriculum developers play a crucial role in implementing feedback and suggestions gathered from participants and parents alike. This iterative process ensures that our curriculum evolves dynamically, incorporating fresh perspectives and addressing emerging educational needs.

2

Dissolving Economic Barriers

Dissolving socioeconomic barriers is central to our mission at gbSTEM. By offering free classes, we ensure that all of our students, regardless of economic background or status, have equal access to our high-quality STEM educational opportunities. This not only removes financial obstacles but also fosters a more inclusive learning environment, engaging a broader spectrum of underrepresented students.

3

Mobilizing Community Strength

We leverage the opportunity to tap into our community by hosting events at the Cambridge Public Library and collaborating with a network of hundreds of volunteer instructors from all over Greater Boston. Additionally, we actively give back to our local towns by participating in and contributing to various community events, fostering a culture of collaboration and shared learning across our region.

4

Empowering Student Futures

We emphasize hands-on learning, and our students have all the more to show for it. We engage young minds through collaborative challenges like biweekly hackathons. With the guidance of instructors, every student creates an original project at the end of each class semester and gets the opportunity to present about it. Our student-to-instructor pipeline provides graduates with valuable resume-building work experience that teaches responsibility and leadership to prepare for future job opportunities. This holistic approach ensures that our students are well-prepared for future careers and empowered to succeed.

Our Impact

1000+ Students Reached
57 Towns
110 Classes
200+ Instructors
25,000+ Hours of Service

> gbSTEM gave my daughter the opportunity to take her first steps in computer science and safe, welcoming, and fun environment. You sparked interest and curiosity in her. Every week she spent hours outside class working on her own Scratch projects in addition to the class projects. Thank you!
> *-Parent of a 3rd grade student*

Connecting People Who Care

A huge thank you to our instructors.

At gbSTEM, our mission revolves around connecting passionate individuals who care deeply about education, particularly in STEM fields. One of our key initiatives involves recruiting instructors from among high school students who are not only academically gifted but also driven to commit their time to making a positive impact in their communities. These dedicated volunteers bring immense perspective and enthusiasm to our programs, embodying a commitment to their students that is truly inspirational.

Our recruitment process finds high school students who demonstrate a genuine passion for teaching and mentoring. We equip our instructors with the skills and resources needed to effectively teach STEM concepts, and provide them with quality teaching materials and support to ensure they can deliver engaging and informative lessons.

Our volunteers represent 48 towns and 78 schools around Greater Boston, and each volunteer contributes 128 hours of community service per year! This year, we are thrilled to see a significant increase in the number of high school students eager to join our instructor team. The doubling of interest underscores a growing enthusiasm within our community for empowering the next generation through education.

Through our efforts, gbSTEM not only connects people who care about education but also cultivates a community-driven approach to learning that prepares students for success in an ever-changing world. Together, we are building a brighter future where every student has the opportunity to excel and make a difference in their communities and beyond.

As we continue to expand our reach and impact, we remain committed to fostering a supportive environment where students and instructors alike can thrive and contribute meaningfully to the advancement of STEM education.

> **We did a class reflection after sharing our final projects: students liked coding because they could remix really cool code, make stories, and make video games. They learned how to code, coding can be hard, but that's okay!! They want to keep coding this summer on Scratch!**
>
> *-- Sadie, Scratch Instructor*

Breaking Socioeconomic Barriers

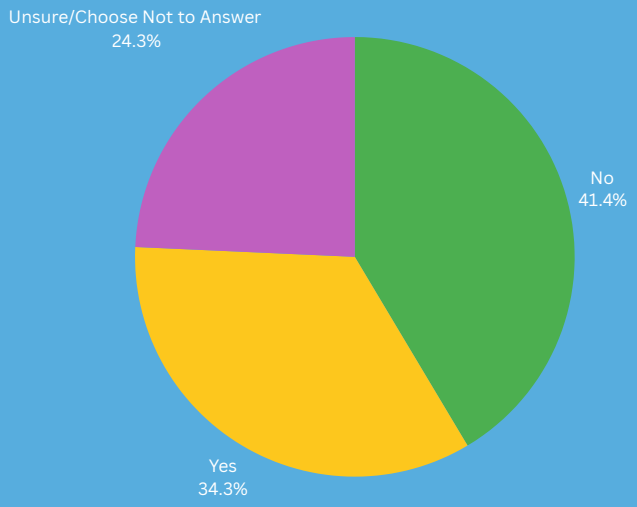
Shaping a More Diverse Future in STEM

Our classes are designed not just to teach technical skills, but to foster a deep interest in STEM subjects. Through hands-on projects, engaging experiments, and real-world applications, we make complex concepts approachable and exciting. This approach helps students see the relevance of STEM in their everyday lives and future careers. For many of these students, gbSTEM's programs are a gateway to discovering a new passion and envisioning possibilities they hadn't previously considered.

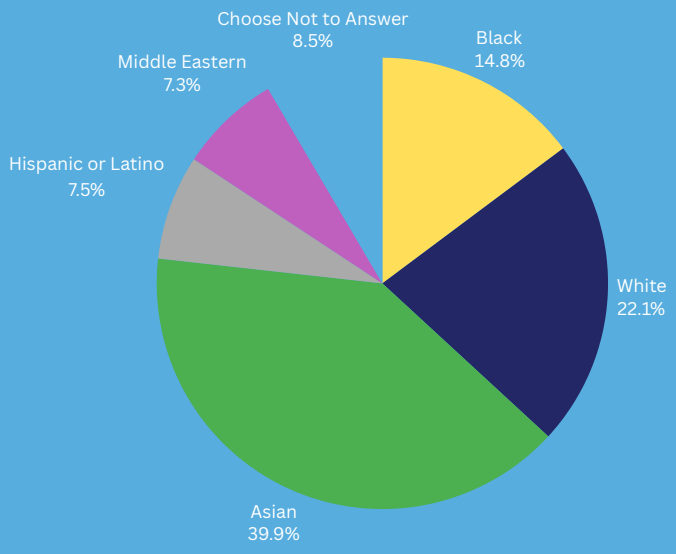
The Greater Boston STEM Program is deeply committed to our mission of addressing the disparities in STEM fields by making our educational programs easily accessible to diverse and underserved communities. This year, we have made significant strides in achieving this goal, reaching approximately 300 Black, Hispanic, and Middle Eastern students, around 700 students of color in total, and approximately 340 students eligible for free lunch programs.

By expanding our reach, we are not only increasing representation within the STEM fields but also fostering a more inclusive and innovative environment. Providing students from underrepresented backgrounds with access to quality STEM enrichment programs helps bridge the opportunity gap and ensures that future technological advancements are informed by a variety of perspectives and experiences.

Free Lunch Eligibility of Enrolled Students, 2023-2024



Racial Breakdown of Enrolled Students, 2023-2024



Empowering Future STEM Leaders

A Project-Based Learning Pipeline

The Greater Boston STEM Program fully embraces a project-based learning approach to cultivate a deep, hands-on understanding of STEM subjects. This method not only engages students in meaningful learning experiences but also prepares them for future success in the field.

Our curriculum is structured around mini-projects built each class, with a final project at the end of the semester. Biweekly hackathons and math challenges further enhance their learning experience, offering students the chance to apply their skills on diverse challenges. These events stimulate creativity and problem-solving skills, while also fostering teamwork, dedication, and a competitive spirit. The opportunity to work on and solve complex problems in a time-constrained environment mimics real-world scenarios and prepares students for future endeavors.

Students tackle societal wants and needs through innovative final projects: games, apps, builds, and beyond. They then present their projects at the end-of-semester showcase, giving them the opportunity to demonstrate and explain their creations to peers, friends, and family. The showcase not only highlights their technical skills but also builds their confidence and presentation abilities.

To ensure the continuity and expansion of our impact, gbSTEM also focuses on developing future leaders within our program. Our student-to-teacher pipeline trains students to give back by becoming instructors themselves, empowering them to teach and inspire the next generation of STEM learners. This approach reinforces their own learning and boosts them in kicking off their careers as young adults in STEM.

We thank you for your continued support of the Greater Boston STEM Program.

Acknowledgements

Authored by the gbSTEM Presidents Team.
Thank you to all of our instructors, leadership, community, and students for supporting us so far. We couldn't have done it without you.

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