Dear Friends,

I am honored to present the Digital Harbor Foundation’s 2018 Annual Report. It is truly humbling to reflect on the progress our youth and staff have made during the 2018 calendar year. Some of this progress is easy to see, such as the number of youth who participated in our courses or the launch of DHF’s National Rec-to-Tech Design Challenge. However, just as important are the hundreds of small and individual victories our youth have achieved over the past year. Whether they cracked a difficult coding problem after hours of effort, rejected stereotypes about who belongs in the tech industry, got their first job as part of our youth employment program, or pushed past their shyness to form new friendships, our youth continually exceed our wildest expectations.

We launched the DHF Tech Center in January 2013 to foster creativity, learning, productivity, and community in order to create economic opportunities for our youth and give them tools to make a better future. We base our work on two foundational principles (1) while talent is evenly distributed, opportunity is not; and, (2) to be successful long term and navigate future changes within the tech industry, our youth must learn how to learn and learn to love learning. These principles still guide everything we do. Our programs successfully support youth who otherwise would not have access to the same technology education and career pathways, and we are continually expanding and refining our programs to ensure that every more and more Baltimore youth are able to attend our programs.

This year marks a particularly poignant milestone for us. As we have grown, the need for a single Director for all of our youth-serving programs at the Tech Center became apparent. As we went though the interview process for the position, we realized that the best person to lead that work was one of our very own former youth, Darius McCoy. Seeing him step into this role is a manifestation of the transformational potential for youth in our programs to directly lead this work.

Thank you for all of your support to make this work possible over the past year. We are excited to see where the future takes us and hope you will continue working with us to create even more transformational opportunities for youth to learn, develop, make, and create their future!

Andrew Coy
Executive Director
2018 Overview

The Digital Harbor Foundation (DHF) is dedicated to fostering learning, creativity, productivity, and community through education. In 2013, we transformed a closed-down Baltimore Rec Center into a Tech Center, where we provide youth-focused technology education programs, work opportunities, and career and college pathways. In 2014, DHF created the Center of Excellence for Innovation in Technology Education to support educators as they teach technology and encourage productive creativity with their own youth.

1,250 youth participated in DHF’s programs and events, including:

- 39 Youth Competing in a Hackathon by Youth, for Youth
- 61 Youth Employees
- 8 Youth Earning College Credit

Another 2,678 community members participated in events, including:

- 11 Family Make Nights
- 20 Conferences, Presentations and Panels
- 4 Youth Showcases
Center of Excellence for Innovation in Technology Education

In 2018, DHF Facilitated:

241 Attendees of 17 Educator Workshops
38,505 Youth Indirectly Impacted by DHF Workshops
1,339 Users on DHF’s Online Educator Resource, Blueprint

Rec-to-Tech

We trained and supported 3 afterschool spaces in Baltimore and Washington D.C. to create their own makerspaces and run DHF’s flagship Maker Foundations course.

In October 2018, we launched the National Rec-to-Tech Design Challenge to inspire and support more communities around the country to replicate DHF’s model.
Summer Maker Camps

Summer Maker Camps (172 youth, Grades 1-12)

Summer Maker Camps run in 2-week sessions for each age/ability bracket (grades 1-5, 6-12 beginning, and 6-12 intermediate). Each session comprises 30 impact hours and focuses on a different theme or skill related to creativity and STEM learning. In 2018, DHF’s youth:

- Created personal websites and set up their own web servers
- Developed 3D digital design and fabrication skills through a wide range of personal projects, from finger puppets to miniature castles
- Learned Python and JavaScript programming languages through hands-on projects
- Created their own robots by combining electronics, digital fabrication, and programming

Afterschool Programs

Mini Makers (99 youth, Grades 3-5)

Mini Makers courses provide youth with a place to explore, build, make mistakes, solve problems, and grow as creative makers. Mini Makers imagine, plan, communicate, and create original projects, from stop-motion animation to Minecraft, Scratch-based video games, upcycling, 3D printing, laser-cutting, and more.

In 2018, DHF expanded our reach to run our first Mini Makers course during the day for homeschooled youth. Due to the success of the program, we are now looking forward to expanding this format into more school-day opportunities.

“It’s AAAAAWWWESSSSSSOMMMMMEENESSSSS!” - youth

Youth Highlight

Jayden, a Mini Leader

Jayden entered his 3D Printing Summer camp with a little more experience than most of his peers, and he loved helping his classmates! Even when offered a chance to design his own, more advanced 3D objects, he politely explained he preferred helping everyone else.

Jayden also loved working on digital fabrication projects at home and sharing them with his classmates, including wood models of his designs, 3D recreations of household objects, and even a full-sized iron man costume!
**Afterschool Programs (continued)**

**Maker Foundations (67 youth, Grades 6-10)**

Maker Foundations is DHF’s flagship, entry-level course in technology, creativity, and making. In **14 weeks**, youth explore the many facets of technology with **hands-on modules**, including digital literacy, graphic design, programming, electronics, and 3D printing. It culminates in a **showcase** at the end of the semester where youth share their projects with friends, family, industry experts, and the community.

**Members (100 youth, Grades 6-10)**

After youth complete Maker Foundations, they are encouraged to become DHF Members, where they access advanced courses that emphasize real-world career and technology skills. These **14-week intensive courses** span a range of **high-growth technologies**, including advanced 3D printing, CNC milling, programming, and web development. Youth also develop **digital portfolios**, which we encourage them to include in resumes and college applications. As of Fall 2018, Member youth are now also able to create their own **independent study courses**, where they work with staff mentors to plan and implement their own, longer-form projects. This year’s projects include a motor powered fan and light up plinko board.

“I made my life better because I learn new things every-time I come here.” - youth

**Youth Highlight**

**Mason, a Creative Mentor**

Mason has attended DHF for 2 years, and in Fall 2018, he decided to create and teach a class of his own. He approached DHF’s Middle-High Program Manager with the idea to create a three-week “mini-course” on Sonic Pi, a live coding environment used to produce music. He created the curriculum, promotional materials, and course slides by himself, and he lead the course with minimal support from DHF staff. Thirteen youth participated in his course—more than had ever participated in a mini course before! Mason taught the course with poise and confidence. He’s a great role model for other youth in our space, and DHF’s staff have learned a ton from him too!
College Credit Opportunities (8 youth, Grades 9-12)

DHF youth can earn credit for Digital Fabrication 101 from the Community College of Baltimore County by completing an 8-month, DHF-designed and executed course that covers a range of advanced Digital Fabrication topics, including 3D Printing, Laser Cutting, and CNC Milling.

“DHF helped me think more about my future and get a head start on college.” - youth

Youth Employment Programs

61 youth, Grades 9-12

3D Print Shop

3D Print Shop is a youth-run, small-batch 3D scanning, designing, and printing business that serves clients around the United States. Youth handle every stage of the business process, including taking orders, troubleshooting printer problems, and creating 3D prints.

Web Shop

Youth develop websites for Baltimore clients, handling every stage of the business process, from identifying client needs, to creating a wireframe, to publishing the finished site.

Program Assistants

Program Assistants help DHF’s Program Specialists design curriculum, create supplementary materials for classes, deliver content, and mentor other youth.

YouthWorks

Youth work with DHF staff mentors to develop and create solutions for needs in our Tech Center. This year’s projects included physical organization improvements such as a new recycling station and lost-and-found, as well as technology improvements such as updating the Makerettes website. Youth also helped develop content for new courses.

“I like working at DHF because of the community, friendly atmosphere, and technology.” - youth
Impact

Youth Satisfaction

We are committed to the satisfaction of youth we serve. As a result, we are proud to report that:

- **85%** of youth had a good experience at DHF
- **80%** are sure they will graduate college
- **78%** of youth believe their opinions and ideas are important at DHF
- **75%** of youth feel safe to be themselves at DHF

“DHF gives opportunities and freedom that not many others allow...they don’t have the community DHF has. DHF is a special place where amazing people have come together to teach youth, and since DHF is not big like a school, you can have good friendships with all of them.” - youth

The staff and students always seem happy to be here and to see me. - youth
Family Feedback

We also seek feedback from the parents and guardians of the youth we serve. Results include:

- **98%** of families agree that DHF has improved their child’s imagination.
- **96%** of families agree that DHF is a safe place for their children.
- **100%** of families report that DHF has improved their child’s “preparation for future success in school, higher education, careers, and life.”
- **94%** of families agree that DHF has improved their child’s creativity.

“(At DHF), my kids have learned about different areas of technology and I’ve seen how their imagination has grown in an environment where your race and social economic status are not important. Also, their confidence and computer knowledge, especially my daughter’s, has improved.”

- parent on children’s experience

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**Graphs:**

- **98% of families would recommend DHF**
  - Strongly Agree: 86%
  - Agree: 11%
  - Neither Agree nor Disagree: 3%

- **100% of families report that DHF has improved their child’s “preparation for future success in school, higher education, careers, and life.”**
  - Greatly Improved: 54%
  - Slightly Improved: 46%
  - Remained the Same: 0%
**Additional Programs and Special Events**

**Game Jam**

DHF held two Game Jams, all-day events where youth programmed their own *video games*, either by themselves or in teams. At the end of each Game Jam, participants played each other’s games and gave each other feedback. Then youth and staff voted on their favorite games and handed out prizes made by the instructors.

**Makerettes**

DHF’s *all-female user-group* meets twice a month to work on their own tech projects. Sierra, one of DHF’s first female youth, initially founded the group to help increase female youth participation. Sierra has since graduated from programs at DHF, but the Makerettes continue to flourish. Female youth consistently use Makerettes as a place to learn, build friendships, and apply tech skills in creative ways.

“This happy place is filled with diverse youth and staff that empower and educate youth, including female instructors who are demonstrating to our girls that women belong in technology.”

- Parent on her daughter’s involvement at DHF

**Family Make Night**

Family Make Night is a DHF signature program where youth and their families work side-by-side on fun and engaging tech projects. From 3D printed cookie cutters to DIY stomp rockets, the projects appeal to all ages and skill levels. Not only do Family Make Nights build tech skills, they build relationships within families and the larger community. This year, *333 community members* participated in Family Make Nights.
Harbor Hacks 2018

DHF’s Youth Steering Committee, which provides regular feedback on DHF’s programs and policies, hosted a weekend-long hackathon, “Harbor Hacks.” The hackathon was created by youth, for youth from across Baltimore City. Every element of the hackathon, from fundraising to recruitment to logistics, was organized by the Youth Steering Committee, with DHF’s adult staff serving in an advisory role. 39 youth participated in Harbor Hacks and created innovative projects ranging from a working mechanical hand to a steampunk peacock!

“It was fun, exciting, and best of all I got to do hands-on things.”
- Harbor Hacks Participant

Youth Highlight

Making Their Voices Heard


The roundtable was driven by the youth and focused on their questions about technology, including: increasing female participation in technology, using technology to improve school safety, and increasing tech education access for more youth. We were so inspired watching young people learn to ask questions and make their voices heard in their local, state, and national communities!
Center of Excellence for Innovation in Technology Education

To scale our impact on equalizing maker and computer science education access to youth, we provide educator and institutional training through the DHF Center of Excellence for Innovation in Technology Education (COE). COE initiatives help educators incorporate technology into their own learning environments.

As DHF increasingly emerges as a local, regional, and national hub for youth tech education and educator capacity building, we are pursuing ways to strategically and sustainably expand our impact by supporting other afterschool spaces in Baltimore and around the country as they create their own tech programs.

Expanding Technology Education Initiative

DHF’s Expanding Technology Education initiative explores the most effective and efficient ways to help other out-of-school-time programs create their own tech programs and deliver our Maker Foundations curriculum. With funding from the National Science Foundation, DHF is supporting three, previously existing afterschool spaces in Baltimore and Washington D.C. as they create and implement their own maker and tech programs. After an extensive application and review process, the 3 sites participating in the Expanding Technology Education Initiative are:

1. **Patterson High School**: A Baltimore public school that maintains an afterschool program that is participating in the Initiative
2. **Art With A Heart**: A Baltimore non-profit whose mission is “to enhance the lives of people in need through visual art.”
3. **Beacon House**: A non-profit that serves youth in Northeast Washington D.C.

Each of these sites received support creating their tech center, training in the technologies and pedagogical methods needed to deliver our Maker Foundations course, and personalized consulting. As of December 2018, all three sites are now delivering their first cohort of Maker Foundations! The lessons learned through the Expanding Technology Education Initiative are informing our new expansion initiatives.
National Rec-to-Tech Design Challenge

In October 2018, the Digital Harbor Foundation, with support from Schmidt Futures and in partnership with the National Recreation and Park Association, the National League of Cities, and the Association of Science – Technology Centers announced the launch of the National Rec-to-Tech Design Challenge to build a scalable model that creates maker and computer science education programs serving youth in Rec Centers around the country. The Rec-to-Tech Design Challenge builds on the lessons learned from running DHF’s Tech Center and our regional Expanding Technology Education Initiative to help local afterschool programs around the country create and launch tech programs that deliver our Maker Foundations course. Selected regional applicants will receive both in-kind services (individualized consulting, training, technical assistance) as well as hard goods (capital equipment and consumable materials) necessary to create and run their own tech programs.

“This initiative will give more communities the opportunity to get involved, and demonstrate how a 21st century rec center can create a brighter future for more young people.”

- Tom Kalil, Chief Innovation Officer of Schmidt Futures

Initiated by this national competition, but continuing beyond it, DHF will recruit and build a Rec-to-Tech coalition of interested cities, technologists, companies, nonprofits, funders, and advocates that will meet both virtually and in-person to share ideas and best practices. We will then encourage and train these local coalitions to leverage this grant and competition to drive momentum and generate additional support for the Rec-to-Tech model.
In-person workshops were the first service offered by the Center of Excellence and continue to play a key role in our efforts to serve educators. We currently offer in-person professional development workshops in the following areas:

**Making for Educators:** Educators learn to integrate Maker activities into existing programs, regardless of size, budget, or experience level. More importantly, they learn to develop a “Maker Mindset,” which fosters innovation, creativity, and hands-on learning.

**3D Printing for Educators:** DHF’s most popular workshop provides educators with the comprehensive hardware, software, and troubleshooting skills needed to bring 3D printing technology to their classrooms.

**Family Make Nights:** Educators learn to plan, organize and facilitate DHF’s signature Family Make Nights, which encourage youth and their families to work side-by-side on fun and engaging tech projects.

**Makey Makey For Educators:** Educators learn to teach basic circuitry and make beginner and advanced-level projects using a Makey Makey, a powerful yet affordable computer microboard.

**3D Printing for Educators Facilitators Training:** We partnered with Idaho’s STEM Action Center to train educators in Idaho to deliver our 3D Printing for Educators workshop to over 80 other teachers.

“I thoroughly enjoyed your workshop. The staff went above and beyond.”
- Workshop Participant

“I knew nothing to start. I love that there are so many resources to help me as I learn more through using the (3D) printer.”
- Workshop Participant

**DHF Blueprint**

DHF Blueprint provides educators around the country with the online resources to begin, maintain, and improve their own tech centers. With over 300 online articles, sample projects, full-length online courses, and digital textbooks, Blueprint is a valuable resource for any educator interested in using technology in their learning environments.
Workshop Impact

We evaluate our COE programs by soliciting feedback from educators about their experience in our workshops and consulting. We conduct initial satisfaction surveys and pre/post skills assessments for educators, and have been very pleased by the results, including:

241 educators attended DHF’s workshops in 2018 with a total indirect impact on 38,505 youth.

3D Printing for Educators

93% of educators found the workshop useful

Workshop overall quality: 9.1

373% increase in confidence using 3D printing technology

Change in confidence using 3D printing technology before and after the workshop: 1.1 to 5.2

244% increase in confidence teaching 3D printing technology

Change in confidence teaching 3D printing technology before and after the workshop: 1.9 to 6.5

Making for Educators

96% of educators found the workshop useful

Workshop overall quality: 9.4

100% of participants would recommend this workshop to other educators

Interest in bringing making into their learning environment: 9.8

66% increase in confidence incorporating making into the learning environment

Change in confidence incorporating making into the learning environment before and after the workshop: 5.1 to 8.5

Blueprint Impact

57,816 Page Views

8 Courses and Digital Textbooks

192 Online Lessons

125 Articles and Project Guides
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Maker Ed
“I definitely know this has made my future.”

- N’Dera (17), Baltimore Sun, p1, November 23, 2018