

STEM Accessibility Workshop

Project Report

August 16, 2019

Background

The need to recruit and train a strong, national STEM workforce has been made clear in council reports from the current and former presidential administrations (PCAST, 2012; NSTC, 2018). However, not all Americans have equal access and representation across the STEM disciplines (NSTC, 2018), as people with disabilities are significantly underrepresented in STEM training programs and careers (NSF, 2019). Roughly one out of every 10 scientists and engineers in the workforce report having a disability of some kind (NSF NCES, 2019). Although these numbers are similar to the percentage of people with disabilities in the U.S. population (U.S. Census Bureau, 2016), these data do not report those with developmental disabilities, such as Autism. At a national level, this underutilized talent across all STEM industries is available, but not being adequately recruited, selected, trained, and retained in the workplace. If not addressed, the representation of people with disabilities in STEM-related degree and certificate programs, and ultimately the workforce, will remain consistently lower than their non-disabled peers.

The STEM Accessibility Workshop was held in response to the STEM Opportunities Act of 2017 (H.R.2653, 2017), the National Science Foundation's call to improve STEM teaching, learning, and workforce development for people with disabilities (NSF DCL 19-033), and the recent STEM Education Strategic Plan, which clearly articulates priorities to: 1. Increase diversity, equity, and inclusion in STEM; 2. Develop and enrich strategic partnerships; and, 3. Prepare the STEM workforce for the future (NSTC, 2018).

Workshop Participation

The STEM Accessibility Workshop was held on August 1 & 2, 2019 in Cincinnati, Ohio. Fifty-seven (57) total stakeholders attended the workshop, which included K-12 STEM and Special Education teachers, parents of children with Autism, students with Autism Spectrum Disorder (ASD), non-profit organizations focused on supporting families with Autism, and STEM industries representing corporate, government, and non-profit agencies.

Organizations Represented in the STEM Accessibility Alliance

Am. Association for the Advancement of Science	NEXT for Autism
The Children's Home of Cincinnati	Opportunities for Ohioans with Disabilities
Cincinnati Bell	Ohio State University Nisonger Center
Cincinnati Children's Hospital Medical Center	Procter & Gamble
Cincinnati Museum Center	Siemens Digital Software
City of Cincinnati, Parks Department	Starfire Council
Disability:IN Ohio	UC Advancement and Transition Services
General Electric Aviation	UC Collaboration for Employment and Education Synergy
Greater Cincinnati STEM Collaborative	UC College of Engineering
Hamilton Co. Educational Service Center	UC Office of Research
Indian Hill School District	UC School of Education
Kinetic Vision	Un. of Washington, Center for Evaluation & Research
Makino	U.S. Geological Survey
Mt. Healthy City Schools	Wright Patterson Air Force Base

During the two-day workshop, participants listened to current best practices of accessible and inclusive engagement in STEM training and workplace development programs. Each individual

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stakeholder group attended small break-out sessions focused on identifying barriers to STEM training and workforce pathways from their individual stakeholder perspectives. Whole group discussions, and open topical gallery walks were held at the end of the first day, and throughout the second day to cross-pollinate perspectives within this Inclusive STEM Ecosystem to ensure the voices of each stakeholder group were included on all topics presented. At the end of the second day, this new ecosystem took on the name of the Cincinnati STEM Accessibility Alliance, and started to formulate ways of addressing barriers across each stakeholder group, as well as a list of needs to ensure the momentum of this workshop continued.

Workshop synopsis

The barriers preventing most people with disabilities from pursuing careers in STEM disciplines fall under the assumption of societal bias and stereotype: those with disabilities are less capable than more *able-normative* people. This cultural perspective shift towards the realization that everyone has strengths the talents of every individual can be found on a spectrum of ability. Disability does not define the true ability of the individual, and when properly trained, everyone can achieve their full potential. To initiate this cultural change, the following primary workshop outcomes must be addressed across all stakeholder groups:

- Communication/advocacy
- Education/Training/Mentoring
- Access to STEM opportunities and experiences

Action Items (in no particular order; parentheses indicate who generated the response)

Communication and Advocacy

- Establish a communication HUB across all stakeholders
- Encourage communication between stakeholders to learn how to best work with people with disabilities (ATS)
- Raise awareness among parents, teachers, and employers of the strengths and abilities of people with disabilities, including those who are neurodiverse, nonverbal, and have severe sensory processing disorders (Students)
- Evaluate current policies for inclusive hiring practices (Industry - OOD)
- Encourage alternative job announcements/application that better accommodate students with disabilities (Parents and Students)
- Create an open, trustworthy environment where people with disabilities can voice their concerns with regards to needs, challenges, and strengths (Parents and Students)
- Facilitate collaborations with experts in disability/inclusion with human resources (Industry)
- Assist employers to understand the value-added contributions of neurodiverse people (Parents and Students)

Education, Training, and Mentoring

- Address complications associated with bias/stereotype across all disabilities
- Encourage employers to visit schools to share information with students/take students to job sights (K-12)
- Provide students with disabilities with proper coursework to set them up for later success (Parents and Students)
- Restructure education systems to tailor the STEM skills through focused training/development for students with disabilities (ATS)
 - High expectations, include transition, and life skills

- Identify and leverage individual student talent and skills with specialized job coaches (Industry - WPAFB)
- Grow job-shadowing, intern, apprentice, and coop opportunities (Industry - AAAS, WPAFB)
- More one-on-one, hands-on mentoring (Industry)
- Facilitate relationships between students with disabilities with potential employers and instructors (Parents and Students)
- Identify specific skills required for a given task and invest in developing the tools and technology needed to support recruiting and onboarding students with disabilities assigned to these tasks in the workplace (USGS, Education, and Industry)

Access to STEM Opportunities and Experiences

- Support clear pathways into the workplace for students with disabilities by offering more apprenticeships in the workplace or by offering alternative certification programs (Industry)
- Provide flexible work environments where people with disabilities can bring the most to an educator/employer (Parents and Students)
- Create non-traditional/alternative work environments across the STEM career pathway
 - Push for more specialized certifications rather than degrees only (Industry)
 - Projects are broken down by skills and tasks which can be achieved by multiple people working on the project (Industry)
 - e.g. have two 0.5 full-time equivalent (FTE) with specific skills instead of one 1.0 FTE employee
- Create personalized and creative routes for students with disabilities (including neurodiverse, nonverbal, and severe sensory processing disorders) to access STEM careers and avoid “One size fits all” systems (Parents and Students)
- Establish more formal focused/targeted partnerships/employment pipelines (K-12; Industry - AAAS, OOD)

Alliance Needs

- Identify federal, state, and local funding solicitations
- Financial support to:
 - hire a part-time Alliance Coordinator/ grant writer
 - transport students to shadow or intern with industry and non-profit partners
 - provide informal education experiences for students
 - develop *inclusive pathways* training modules for all stakeholder groups
 - continue follow-up Alliance meetings
- Each stakeholder group needs to develop a series of goals - identify one or more areas within their organization that can be addressed in short, intermediate, and long term timelines

Action Items in Process

- Cincinnati STEM Accessibility Alliance Listserv created August 6, 2019 (Atchison)
- Workshop data analysis (Carabajal, Sellers, Castro, Atchison)
- Discussions underway to identify an Alliance Coordinator (Atchison, ATS)
- Follow-up meeting planned for November 2019 (Atchison, Castro)
- Meetings with additional stakeholders to expand the Alliance (Atchison, Murphy, ATS)
- Seeking grant solicitations (Atchison, Reed, Murphy, UC Foundation)