Access CS for All: Champions for Accessibility

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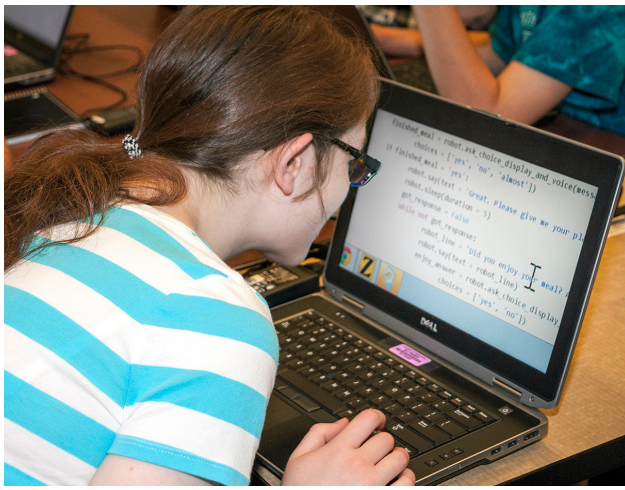
7.6 MILLION

That's the number of students in the U.S. with some type of disability. These range from learning and intellectual disabilities and autism, to blindness, deafness, and mobility and dexterity limitations.

While programs like **Computer Science Principles** (CSP) precipitating from the **CSforAll** movement have made huge strides in addressing under-representation, the tools and curricula that accompany them have often been inaccessible for some students with one or more of these disabilities. Screen reader devices used by students who are blind, for example, cannot pick up on information embedded in images without text-based alternatives. Audio-based tools lack the captions or transcriptions required by students who are deaf. Students with "hidden" learning disabilities like dyslexia lack the supports to demonstrate their intelligence and knowledge in the classroom.

A student with visual impairment uses screen magnification.



Richard Ladner (University of Washington) works with a student learning to program in Quorum.

In 2013, two of the computing education field's biggest accessibility champions came together to change this through a truly inclusive initiative, **AccessCSforAll**.

A collaborative effort of a huge team of National Science Foundation supported CS education researchers, classroom teachers, and curricula developers, AccessCSforAll is led by **Richard Ladner** from the University of Washington and **Andreas Stefik** from the University of Nevada, Las Vegas (UNLV). The cohort has worked tirelessly to spread awareness and create resources for students who are blind, deaf or have learning disabilities, with a focus on CSP.

The central tool in their effort is a specialized coding language, **Quorum**, developed by Stefik and his team at UNLV. Launched in 2009 for blind and visually-impaired learners, approximately 300,000 programs have since been written in the language online and thousands of people use it all over the country.

Since Ladner and Stefik's partnership with **Code.org** in 2013, AccessCSforAll has created the ONLY version of CSP that is accessible for students with disabilities. Earlier this week, Code.org and the

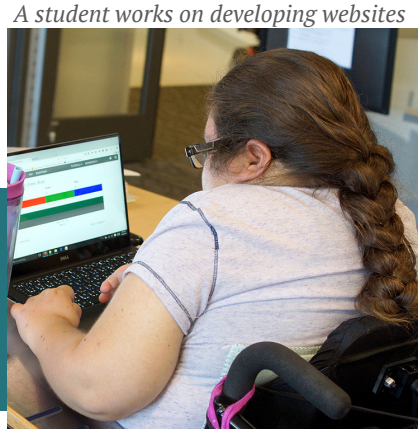
Left panel: *The Quorum team at UNLV. From left to right: Jack Mackey, Cristina Panks, Matthew Gordin, Xinke Cao, William Allee, Merlin Drews, Andreas Stefik, Tim Rafalski, and Patrick Daleiden* ***Right Panel:*** *Andreas Stefik works with a student who is developing a program in Quorum.*

[Computer Science Teachers Association] recognized their hard work with a 2018 Champions for Computer Science [Award] for Expanding CS Opportunities. Melinda Gates described this as a "lifetime achievement award" with a different name, so as not to imply that their work is done.

To assess the effectiveness of their CSP course on student success, the team has partnered with mainstream schools and those serving students who are blind. These outcomes will provide resources for CS teachers that will be expanded over the next few years for teachers serving students with hearing and/or learning related disabilities.

To ensure proper evaluation when these students sit for the AP-CSP exam, they have also partnered with The College Board. Generally, The College Board recognizes the inclusion of students with disabilities and provides accommodations for their participation in their exams. Nonetheless, while their [Equity and Access] statement mentions ethnic, racial, and socioeconomic groups as being under-represented in computing, the absence of students with disabilities from this list is glaring.

A student works on developing websites



At the heart of this work is the recognition that students with disabilities are generally quite capable of completing rigorous computing courses like CSP. However, this is only the case when tools, curriculum, and exams are accessible.

Therefore, building teacher capacity through intentional professional development opportunities is critical. Last summer, AccessCSforAll held a CSP workshop for teachers of the blind and visually impaired. Working in pairs, teachers used the AccessCSforAll CSP curricula to prepare a creative, accessible lesson for their colleagues. By sharing experiences from their own classrooms, the teachers not only gained knowledge of the curriculum and Quorum language, but also built a strong sense of community. At the end of the day, they returned to their classrooms with a toolkit of strategies, tools, and lesson plans to better serve their students.

The workshop's success led to the development of more professional development events that the group intends to head up in the next two summers, with teachers from schools for the deaf and schools for students with learning disabilities.

The impact of AccessCSforAll on the computing education community culminated this fall at the [CSforAll Summit], in which the team announced its partnership with the CSforAll community to launch the CSforALL [Accessibility Pledge].

With over 100 organizations signing the pledge last year, the national community of CS education content creators, program providers, educational institutions, researchers and investors have committed to immediate steps that achieve accessibility in existing efforts and ensure future efforts address accessibility from the very start.

While the community has rallied behind this initiative, the entire computing field must pledge to help further the efforts of AccessCSforAll in creating inclusive learning environments for students with disabilities that truly make computer science for ***all***.