

I took my first computer science class as a senior in high school, and only because I had to. I attended Thomas Jefferson High School for Science and Technology, and was required to take an introductory computer science course as part of our special advanced diploma. I loved it, and I was good at it.

I want to be clear that I never would have taken that course were it not required. Why? Because I believed that computer science wasn't something I'd be good at, despite all of the signs being there if I look back. As a child, I loved logic puzzles and math games. I enjoyed solving problems as a member of an Odyssey of the Mind team. And still, I didn't see computer science as something that was for me because I didn't realize that computer science was something girls did.

My name is Jen Manly and I've been a computer science teacher for over eight years now. I started teaching middle school computer science at Old Mill Middle School South, then taught high school CS at Paint Branch High School, and now teach introductory computer science at the University of Maryland as an adjunct. My full time role is with the Computer Science Teachers Association where I serve as our Membership Experience Manager. In that role, I work with over 20,000 computer science teachers from all over the world.

Over the past 8.5 years, I have worked within my own schools to increase access to computer science courses. If you're not familiar, Old Mill Middle School South is a STEM magnet middle school. It's actually a school within a school, where approximately 30% of the students are in the STEM program while the other students are not. Computer science was a subject that was required of every STEM student in every grade level but was not offered to students not in the magnet program.

During my time at Old Mill, I advocated and was successful in offering a robotics course option for eighth grade students. When I taught that course, I had students of varying ability levels, varying special education statuses, and English Language Learners. When we opened up the course beyond just the STEM program, we saw an increase in racial and gender diversity on top of a wider range of special education statuses. The bottom line is that many students were successful in and enjoyed that course, and deserved access to it.

When I arrived at Paint Branch, we only offered Foundations of Computer Science. FOCS is an introductory course offered at many middle schools in Montgomery County Public Schools. In one year, we grew from two sections of FOCS (60 students) to nine sections of three different CS courses (approximately 270 students), including AP Computer Science A and AP Computer Science Principles. The demographics of our courses matched the demographics of the school, which has over 82% Black and Latinx students.

Growth of our program in a way that matched school demographics required actively recruiting students. We visited math classes of all levels, scheduled 1:1 meetings with students to answer questions, tabled at school-wide events, and intentionally met with counselors to help them advise students on which computer science course to take. I was able to dedicate time to this endeavor because I had a hybrid role with the University of Maryland which provided me with additional planning time for program growth.

Research data suggest that while improvements have been made in reaching women and underrepresented groups at the upper high school level, it has made little impact on the number of women intending to pursue computer science as a career. Multiple independent research papers have suggested that attracting and retaining women and underrepresented groups in technology begins much earlier, in upper elementary and middle school. If our goal is true opportunity for all students to succeed in computer science, providing access is not enough; we need to intentionally work to ensure representation of all groups in high school level CS courses.

Equity in computer science coursework begins with equity in access. The research consistently concludes that early experience with programming correlates with choosing to take a computer science course or declaring a computer science major at the collegiate level. Counselors and educators should be trained to share computer science coursework as a potential course offering to all students.

Closing the gender and race gap in tech begins with closing the gender and race gap in computer science education. Despite the fact that women make up only 26% of the computing workforce (NCWIT, 2019), with only 9% of the computing workforce being made up of women of color, changes to pedagogical approaches to computer science at the secondary level could significantly impact collegiate enrollment of women in CS. With the projection of a decrease in the number of true computer programmer roles while dynamic, collaborative roles within computing are on the rise, there is no better time to develop multi-faceted computer science curriculum to better meet the needs of girls and our work force.

This bill is so important because if we care about diversity in tech, we have to care about representation in high school CS courses. We have to care about offering a full CS pathway at the elementary and middle school levels. If we believe that every child deserves the opportunity to learn computer science - to figure out if it is for them - we have to intentionally work towards representation. It's not enough to simply put up fliers or offer the coursework. Students, particularly from underrepresented groups, may not know that it's for them because they haven't seen someone like them in tech.

It's also worth noting that ultimately, learning computer science isn't just about learning how to code. It's about practicing problem solving, building tenacity, and learning how to logically and

creatively approach challenges. In fact, before I became a computer science teacher, I wanted to be a lawyer, and I continued to take computer science coursework in college because I found it made me better at writing my political science papers. Learning computer science taught me how to think and it taught me how to persist, skills that will serve our students at every level even if they go on to pursue a completely unrelated career.

Maryland computer science teachers have been teaching about Artificial Intelligence and Cybersecurity for years, but with the public release of ChatGPT and other generative AI, it is critical that Maryland's Computer Science standards address and account for these emerging topics. As students have growing access to AI, inclusion of critical curriculum that equips students with the ability to use these tools responsibly is vital. Our students are preparing for a world in which tech touches every area of their lives, and understanding both AI and cybersecurity on a deeper level will help them to be conscious consumers whether they pursue a career in technology or not.

From a national level, Maryland is a leader in Computer Science Education. The commitment that this body made to Maryland's students by requiring high school computer science is incredible, and should be celebrated. And now, you have the opportunity to continue to push Maryland forward as a leader in CS Ed through Senate Bill 980. The commitment this bill makes to ensuring that all students are offered equitable access to coursework is important, and will serve as a model for other states in the future. The emphasis on growing elementary and middle school computer science will directly impact enrollment in computer science coursework at the high school level as well as the diversity of computer science majors at universities in Maryland. The ripple effects of this bill will be felt for decades.